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IN the article on The Supply Department, printed in another column, Mr. McVeigh asks several questions which are already answered in Mr. Pearce's book. For instance, after running over the course taken by a requisition under Mr. Pearce's plan, he asks what is gained by it. Mr. Pearce has already pointed out that by having the requisition pass through the office of a general storekeeper duplications of orders are discovered and, particularly, the desired material can be supplied quickly to the divisional officer from stock on hand from some other point on the system. It would seem that Mr. McVeigh could get a better answer to the question he asks by first explaining why Mr. Pearce's answer does not satisfy him. Similarly, he criticizes routing outside purchases through the general storehouse instead of directly to the division or point of application. Mr. Pearce devoted some space to explaining the advantages of this and Mr. McVeigh does not answer Mr. Pearce's points. Again, he says that Mr. Pearce's general storekeeper's duties and functions are a duplication of the division storekeeper's work. Mr. Pearce emphasizes the point that the general storekeeper should be freed from detail and should spend his time, in part, in "maintaining the organization, strengthening the weak places, providing facilities . . . On him devolves, probably more than any other officer, the maintenance of standards." Is this a duplication of the division storekeeper's work? Discussion on this subject will be of immediate value, and perhaps we can get it by criticizing each other in the same friendly spirit which characterizes Mr. McVeigh's paper.

TWO trust companies and four banking firms in offering at 106 and accrued interest $10,000,000 of New York State Canal improvement 4 per cent. gold bonds, call attention in their circular to the fact that two years ago the 4 per cent. bonds of the state of New York were selling at 114 and interest; that is to say, the drop in the interval of two years has been 8 points. Thus, as tested by the price of these bonds, state securities of a character as unquestioned as cash itself have followed, or, more strictly speaking, attended the fall of municipal bonds of high grade. In Connecticut a state loan has had to fail temporarily, owing to a similar change in the standard of investment rate for bonds. And all this comes to pass at a time when money is cheap and large private funds should be seeking investment. It is pertinent and timely to ask whether a very powerful cause in this decline of public securities does not go back to federal and state policy toward the railways. The line of reasoning runs in some such sequence as this: The steam railway bond is, on the whole, the standard bond of investment. That the federal and state policy has dislodged much investment from railway shares and forced down their market values must be conceded. The timidity of investors reaches to some extent to railway bonds as well as stocks. But so long as such bonds and those of other public utilities, especially street railways, render a decidedly higher return than the state or municipal security the latter suffer acutely by the competition. A policy that forces down one very extensive and high class security in the market affects other securities and affects most directly those that are also of as high grade or higher. New York wants to market bonds to build her large canal, Connecticut to improve her highways. Both the canal and the highways must cost more as the sequel of a policy that inflicts railway hardships. The analysis carried a step further shows the citizen paying, by increased taxes to meet increased bond interest, for a condition ensuing partially from anti-railway legislation. The statement can be generalized into the proposition that no great vested interest can be unduly attacked without reaching other vested interests and, at the last, the taxpayer as a kind of "ultimate consumer." In connection with the subject the increased advertisement of Canadian securities calling attention to the transfer of investment across our northern boundary line is suggestive as an interpretation of results of the divergent policies of the two countries.

THE inequality between the wages of certain classes of railway employees and certain classes of railway officers was referred to in an editorial in these columns May 5. A similar inequality, which is adapted to cause even more serious results, exists between the wages of different classes of employees. The wages of members of the labor brotherhoods have been repeatedly increased during recent years until now, in many cases, they are excessive in proportion to the quantity and quality of the work done for them. Meantime, almost no corresponding advances have been given to unorganized workers, such as the great majority of section foremen, signal maintainers, bridge and building employees, station agents, etc. To suggestions that the wages of these unorganized employees should be put nearer on

a parity with those of organized employees, railway officers are apt to answer that the roads cannot afford to do it. But to pay high wages to the members of the brotherhoods, and keep down those of the unorganized men, is calculated to foster discontent among the latter. They are very apt to say, and with much truth, that the railways will pay high wages only to those who extort them; and that the only way for the unorganized employees to get their deserts is to organize. Railway managers denounce the attitude assumed and the course taken by the brotherhoods; but by treating the members of the brotherhoods better than the unorganized employees they offer a direct incentive to the organization of the latter. A good many railway men think that the best way to deal with the situation is to pick out those among the unorganized employees who are the most competent and faithful, and increase their wages. This would be preferable to flat advances in pay, because it would encourage those who receive the increases and stimulate those who do not receive them to try to do better work in order also to secure them. Furthermore, when attempts were made to unionize the unorganized men, those among them who had received increases in pay would be more apt to oppose the movement because they could have little to gain and might have much to lose by joining it. While it may seem that voluntary increases in wages would unnecessarily increase the expenses of the companies, it is certain that voluntary increases to those employees specially meriting them would, in the long run, cost a great deal less than general increases compelled as the general increases to organized employees have recently been compelled.

ARBITRATION OF RAILWAY LABOR DISPUTES.

WE present in another column a second letter from President Delano of the Wabash on arbitration of railway labor disputes. Mr. Delano's first letter was published in the *Railway Age Gazette* of April 7, page 820. The subject to which it related has since been discussed in these columns by representatives of both the railways and the railway brotherhoods. (See *Railway Age Gazette,* April 21, page 934, and April 28, page 979.) Mr. Delano makes clear in the letter we give this week that he does not advocate compulsory arbitration. He merely favors arbitration without any compulsory feature, and conducted by a different kind of tribunal from those which heretofore have arbitrated railway labor questions.

It will be granted, we think, by all who have considered the subject that arbitration ordinarily is preferable to strikes and lockouts as a means of settling wages and conditions of employment. This is especially true when those concerned are transportation companies and their employees. The public then has a special interest because of the nature of the railway and of the service that it renders.

Both mediation and arbitration of railway labor disputes under the Erdman act have proved unsatisfactory. They are much preferable, of course, to strikes and lockouts, but they fall far short of being ideal means to the desired end, which is not merely the avoidance of strikes and lockouts, but also the settlement of the questions involved in a way that will be just and beneficial to the railways, the employees *and the public.* In conducting mediations, Judge Knapp and Mr. Neill have never pretended to get settlements which would be just and permanently expedient. That is not the function the Erdman act gives to them as mediators. Their sole function, and the only thing that they try to do, is to secure settlements which will prevent breaches between the employers and the employees that would interrupt railway service. Their method has been simply to present to each side the arguments and proposals of the other until finally a basis of agrement is reached which will prevent a breach. What this basis will be always must depend on the circumstances existing at the time and not on the equities involved. The side which, for the moment, under the particular conditions existing, has the greater strategic strength, and not necessarily the one which is in the right, gets the best of the negotiations.

If the controversy goes to arbitration the board is composed, as Mr. Delano has pointed out, of one representative of the railways, one representative of the employees and a third person chosen by them or by the mediators. The representative of the railways always favors the railway side, the representative of labor always favors the labor side, and the third arbitrator determines the award. He usually knows little about the transportation business or the underlying equities of the parties, and bases his decision on a superficial knowledge of the transitory conditions existing at the time gained during the progress of the arbitration.

Mr. Delano proposes to substitute for such bodies a national board composed of men chosen because of special fitness for its work, and appointed for a period long enough to enable them to get the knowledge and experience necessary to rendering decisions which would not merely prevent strikes, but which would be adjudications between the parties based on consideration, not merely of their transitory rights and claims, but also, and chiefly on the enduring rights and interests of the public. It would carefully examine the testimony introduced and the issues involved, and render an opinion setting forth the facts proven, the principles involved and the basis on which, in its judgment, a settlement ought to be reached. It would have no authority to enforce obedience to its decision. It is very questionable if such power could be conferred, because to give it such power would be to empower it to compel the railways to employ men against their will and to compel men to work against their will, and probably no law can give anybody that power. Slavery was abolished in the United States over 40 years ago.

In its inability to enforce its decisions such a body would differ from other courts. But the enforcing of decisions is not the only function that courts perform. One of their most important functions is to render opinions in which the facts developed, and the duties of the parties to each other, are set forth. Their function of defining duties is no less important than their function of compelling their performance. Once a court of arbitration had defined the duties of the parties, public sentiment probably could be relied on to enforce their performance; for the court would define not merely the duties of the parties to each other, but also their duties to the public; and public sentiment, in holding them to a performance of their duties to the public would at the same time hold them to a performance of their duties to each other.

All discussion of this question which ignores the interest of the public in it, or which asumes that the public has no interest in it except to prevent strikes, is valueless. The public is very directly concerned in the conditions of employment and the wages paid on railways. The total wages paid by the carriers to their employees amount to a billion dollars a year. This is 60 per cent. more than the total amount paid out in interest and dividends. There is only one source from which the money to pay these wages can be derived, and that is from the rates paid by the public for transportation. It is to the public interest that railway employees shall receive good wages, and enjoy favorable working conditions. But it is not to the public interest that they shall be paid excessive wages or that their conditions of employment shall be such that they shall not give one dollar's worth of work for every dollar in wages that they receive. And when a dispute arises as to whether wages shall be raised or reduced, or whether the piece work system shall be introduced or abolished, the public ought not only to participate in reaching a settlement, but it ought to participate in such a way as to protect the rights of all—including its own.

The railway is a public service corporation. Every person who enters its service assumes part of the responsibility for its performance of its duty of giving good service at reasonable rates. This does not apply merely to the board of directors.

the president and other higher officers, but it applies to every engineer, conductor, brakeman, fireman, section foreman and track walker. The public has asserted its right to have something to say about the relations between railways and their employees by enacting the Erdman act. The question, therefore, is not whether there shall be any arbitration at all. That is settled. The question is whether there ought not to be some improvement in the present method of conducting arbitrations. Mr. Delano's suggestion as to the way this improvement shall be made seems to be the best that has yet been offered.

THE EXPRESS COMPANIES, THE RAILWAYS AND THE PUBLIC

THE express companies of the United States are daily laying up more trouble for themselves. Their rates are the object of attack from many sources. The evidence which has been introduced before various state commissions, the recent statistical report of the Interstate Commerce Commission regarding them, and the innumerable newspaper and magazine articles about them that are being printed, are convincing the public that their rates and earnings are indefensible. Meantime, when representatives of the companies appear before the commissions and courts to defend themselves they commonly show more disposition to conceal, than to give, pertinent information; and they are doing almost nothing to conciliate or educate public sentiment.

One of two things is true: Either the rates are indefensible, or they are defensible. If they are not defensible they ought to be changed. If they are defensible they ought to be defended very differently from the way they have been thus far, both before commissions and courts, and before the court of public opinion. The best course for the companies to take, if they want the public convinced that their position is untenable, is to continue the utterly stupid, Bourbon policy that they have followed thus far. The Pullman Company, whose relations to the railways are somewhat similar to those of express companies, exhibited much better sense. Seeing that it must either defend its rates or change them, it promptly adopted the latter alternative, and not only reduced the charges directly under attack, but made corresponding reductions throughout the country. The facts to which those who investigate these subjects have access indicate that the Pullman Company had a better case to defend than have most of the express companies. The companies may gain temporarily by continuing to pursue the policy they have thus far followed, but, in the long run, it will cost them much more than it will profit them. The time is past when any public service corporation in the United States can afford to assume an arrogant attitude toward the public, or, ostrich-like, stick its head in the ground and hope that the people will overlook or forget about it.

The relations between some of the railways and some of the express companies are very close, and it is high time that the railway managers used their influence to cause the express companies to assume a different attitude. There is no evidence whatever that the earnings of the railways for handling express are excessive. The preliminary report of the committee on railway mail pay, issued January 6, 1911, shows that the average revenue of the roads per 1,000 ft. miles from the transportation of mail is $3.23; express, $3.86, and passengers, $4.42. As the average freight train revenue per mile is $2.76, while the average passenger train revenue per mile is only $1.27, it seems probable that the railways are actually deriving less net revenue in proportion from the handling of express than they are from the handling of ordinary freight. But the express companies are agents of the railways for the performance of the express service; and if they do not render that service satisfactorily and at reasonable rates, the public is justified in holding the railways largely responsible, and will do so. Under the arrangement by which the railways receive for the transportation of express matter certain percentages of the gross earnings from it, any reduction in the express charges involves a reduction in the railways' part of the revenues. The railways have, therefore, a very important interest in having the entire question of the relations between the express companies and the public settled on a satisfactory basis. Railway officers being directors in a large number of express companies; the express companies in all cases being mere agents of the railways; and a number of them being owned by the railway companies, the railways can exercise a potent influence in bringing about such a settlement, and they ought to do it.

RAILWAY PROMOTION OF NEW ENGLAND INDUSTRIES.

THE New Haven system, including the New Haven, the Boston & Maine and the Maine Central, has established, with headquarters at Boston, an organization under the title New England Lines Industrial Bureau. Its name indicates its general purpose. It is to lend the railway's influence in ways both active and systematic to the enlargement of any form of New England industry, the cost resting on the three railway lines. The two main objectives are, obviously, the factory and the farm. But outside of them there are in New England interests of large importance, some of which stand in a most direct relation to railway business. For example, the hotel and boarding house interests of the White Mountain region alone—saying nothing of summer camps—is of the utmost value. So are such side interests as the preservation of the New England forests, almost extinct in the lowlands, beginning to pass in the uplands. There is the fishing industry of the coast, bound to grow as the cities grow—an industry which reaches far beyond New England; and there are other products, such as ice and quarried stone. In diversity of industries it is probably fair to say, particularly when the variety of her factory output is considered, New England far surpasses any area of similar size in the United States or, perhaps, the world.

The causes which have led to the progressive farm depression in New England are pretty familiar. In their front have been the rivalry of the richer soils of the West, the more steady and higher returns of the factory and mercantile vocations of the cities and the magnetisms of city life for the younger sons of the farm. These through long decades drew away the bone and sinew, as well as the mental ambitions of the farm. Soils and structures of the farm alike ran down; and, as though such evil forces were not enough, there have been added a horde of insect pests attacking field crops and fruits. By a striking but more natural coincidence the factory interests of New England have of late years met rivalries as well as the farm. As populations have grown westward, rival factories nearer the markets created by population, economizing transportation charges, were sure to grow, and have done so. So were rival factories nearer the raw material, like the multiplying cotton factories of the South. These forces have not prevented the New England factories, taken as a whole, from expanding, but they have cut them down from their old normal rate of increase. Measured by population the New England farm as compared with the factory shows positive and continued loss. By the new census 123 farm towns in Massachusetts show during the last census decade a drop in population from 205,217 to 175,542; 69 rural towns of Connecticut show a population practically stagnant, in spite of new foreign elements; and the same is true of the whole state of Vermont, essentially a farming commonwealth.

In the light of the plan of the three New England lines and its wide industrial scope, their classification of traffic during the last fiscal year is interesting as set forth in a condensed table:

	Tons.
Products of agriculture	5,079,946
Products of animals	1,663,788
Products of mines	12,407,830
Products of forests	4,623,570
Manufactures	9,399,982
Miscellaneous, including merchandise	12,379,393
Total	45,554,509

When this general table is analyzed by its items in the original and detailed returns, the results become impressive in their bear-

ings on New England railway transportation in so far as it can be affected by the new promoting bureau. Certain very large items drop out immediately, including the products of mines; grain, flour and other mill products alone take out probably 2,000,000 tons from products of agriculture, and a considerable but indefinite subtraction must be made in the products of animals, and a lesser subtraction from manufactures. But there remains, at a rough estimate, probably 40 per cent. of the total tonnage to be attributed to New England origin, with manufactures much the largest item and farm products comparatively trifling. The work before a railway industrial bureau, in the main, is therefore the bracing up of a languishing farm industry on the one hand and the sustenance and enlargement of a great factory industry, threatened somewhat by external competitions, on the other. To these may be added another important branch, the development of water powers. These, like farming, have languished in New England outside of cities on swift and large rivers. Transmission of electric power has now given new values and economic meanings to remoter streams, and the conservation of their waters. In the case of the hitherto decadent New England farming there are also some rays of light. Such social forces as the telephone and rural free postal delivery have measurably enhanced the farm satisfactions and reduced the counter magnetism of the cities; and intensive fertilization and the application of scientific methods to soil and orchard are offering fresh outlets of positive profit.

The outcome of the New England Lines Industrial Bureau will be watched with the most acute interest. It can easily fail through lack of intelligence and energy. It can, on the other hand, given vigor, judgment and the proper resources, be made a mighty coefficient in a local development equally beneficent to producer and carrier. If successful, not the least of its values would be the welding of a new link in the community of interest between the railway and the people and the substitution of new friendship for old asperities. The recovery of the last few years proves that New England needs such an era of good feeling scarcely less than the West.

NEW BOOKS.

The Coal Trade. By Frederick E. Saward, Editor of *The Coal Trade Journal.* Published by *The Coal Trade Journal,* New York. Cloth, 190 pages, 6 in. x 8 in. Price, $1.50.

This volume is the thirty-eighth annual edition published by the author, who has been editor of *The Coal Trade Journal* for 42 years. It contains a review of the trade for the past year, including statistics of special value to those interested in coal production. The yearly coal tonnage of the United States has now approached to within a few thousand tons of the half-billion mark, while the coal tonnage of the world at large is a billion and a quarter.

Index to Signal Literature. Railway Signal Association; office of the Secretary, Bethlehem, Pa. Cloth, 185 pages, 6 in. x 9½ in. Price, $1.00.

This valuable index, prepared by a committee of the Railway Signal Association, W. J. Eck, chairman, was presented at the annual meeting of the association at Richmond, Va., last October and has already been noticed in the *Railway Age Gazette.* The bound volume has just appeared, and copies may be had of the secretary. The index to articles in technical journals which constitutes the body of the work fills 135 pages. The reader who observed that this index looked a good deal like an index to the last 25 years' bound volumes of the *Railroad Gazette* did not have our authority for the statement; but we do admit that we have printed quite a number of signaling articles during that time, including some that the committee overlooked.

Besides the index of articles in periodicals there is a catalogue of books which deal with signaling subjects, filling a dozen pages; a list of colleges and schools which give some attention to signaling; and information concerning educational work done by railway companies.

Letters to the Editor.

ANOTHER LETTER FROM MR. DELANO ON ARBITRATION OF LABOR DISPUTES.

Chicago, May 6, 1911.

To the Editor of the Railway Age Gazette:

From the letters of P. H. Morrissey, President American Railroad Employes' and Investors' Association, in your issue of April 21, and W. S. Carter, President of the Brotherhood of Locomotive Enginemen and Firemen, in your issue of April 28, as well as from private letters received from various friends who have read my letter on the labor situation, I see that I was misunderstood.

Mr. Carter, particularly, assumes that I believe in compulsory arbitration, and it is very evident that I did not make clear that I regard arbitration, at best, only as a last resort, to be invoked only in preference to an actual conflict, or strike. I believe thoroughly in the Lemieux act of Canada and in the Erdman act in our own country, in so far as those acts provide for investigation of the controversies or disputes, and mediation between the parties; but what I object to in each of these acts is the arbitration provision. Furthermore, my statement that the arbitration provision does not work with entire satisfaction, and that it is unsatisfactory both to the employer and the employee, is bore out by the statements of both Mr. Morrissey and Mr. Carter.

I am well aware, and fully appreciate, that compulsory arbitration cannot be made practical; and that under any arbitration agreement there is nothing but good faith on the part of the employer or the body of employees, to make it effective. Either party to an arbitration agreement might refuse to be bound by that agreement, and good faith of the parties and the consciousness of the force of public opinion are the only effective agents of compulsion.

I agree with all that Mr. Morrissey has said in his letter about the progress of events in the situation, and I am optimistic enough to believe that this problem will in time be worked out in a better way for all concerned. It is often darkest just before dawn. However, it appears to me that both Mr. Morrissey and Mr. Carter overlook the public side of these questions. The point which I tried to bring out is that this is not a question in which employer and employees alone are interested, but that it is a question in which the party most vitally interested is the general public. How, then, is that interest to be represented? That is the question.

The great value of courts of law arises, not so much from the cases they actually consider and dispose of, as from the fact that they stand as tribunals to decide grievances between citizens, corporations, etc. Most good citizens rarely, if ever, have lawsuits, and, in proportion to the amount of business transacted, there are probably fewer lawsuits today than formerly. Nevertheless, it is worth a good deal to every citizen to feel that he has a code of judicial procedure provided and a tribunal to which he can appeal if another citizen tries to do him an injury or rob him of his property or his privileges. It is only, then, in the sense of a tribunal that I suggest a court of arbitration.

Then there is another point. Thinking men of this century, and men who mean to be fair, are coming to see that one of two principles must obtain; that prices must either be regulated by the laws of competition, or they must be regulated by public authority. This applies equally to the trust manufacturer, to the railway or other public service corporation, and to the labor organization. Each has found that competition may go to ruinous extremes, and in order to prevent competition going to these ruinous extremes, combinations have been formed. Whether these combinations, either of capital or labor, are within the law or without its pale, we do not know yet; but, regardless of what the Supreme Court decisions may be, it is

certain that unlimited competition can never exist for long. The more powerful the competitive forces arrayed against each other, the worse will be the conflict, and the ultimate result of any such conflict is the survival of the strongest and the degredation of the weakest. The labor union has dealt with this problem as between laboring men, seeking to check competition and maintain a reasonable minimum wage. As stated in my first letter, I find no fault with this attitude; all that I contend is that this great force cannot be left unrestrained and unchecked.

F. A. DELANO,
President, Wabash Railroad.

THE RAILWAY LABOR SITUATION.

CHICAGO, April 30, 1911.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Mr. Delano's letter in your issue of April 7 very graphically sets forth the existing labor conditions on our railways. The solution of the problem presented is much more difficult than to describe these conditions, and in my opinion is not to be found in compulsory arbitration.

A prominent labor leader, in a recent address before a graduating class of divinity students of a large eastern college, said: "If I were asked to offer a solution of the great vexed question of modern industrial strife, I would unhesitatingly recommend a literal application of the golden rule." This, of course, sounded good to the embryo ministers, and undoubtedly was accepted by them as gospel. Personally, I would be inclined, as the Chinese are, to turn the golden rule around, and offer it as a solution in the form in which Confucius offered it to his countrymen: "Others will do to you as you do to them." This, at least, comes nearer human nature and practice.

There is no way under our form of government that compulsory arbitration can be brought about. It is very alluring to talk about, but we might just as profitably discuss compulsory arbitration of rates. While it is perhaps true that in Canada something has been accomplished under the Lemioux Act in postponing or preventing a break between capital and labor when their relations become strained, the controversy is settled ultimately as in the United States—by concession or force.

Railway employees have learned that, "Whom the gods destroy they first make mad." Therefore, they do not, in these enlightened days, go off "half-cocked." They have also an unwritten law that a strike can unmake a labor leader of the higher class as quickly as it has been known to eclipse a railway manager. Therefore, diplomacy is as essential on one side of the question as on the other.

I am not willing to admit that our Canadian cousins have gained any material advantage under their semi-compulsory arbitration act, at least on the railways. Working rules have been accepted by the managers that are considered onerous on this side. There are also, perhaps, favorable conditions that do not exist here; both the rules and the conditions being incidental to environment and the peculiarities of the situation. It is to be noticed that, however, in dealing with certain classes the Canadian managers avail themselves of our "mutual protection" conferences; so that it may be considered that honors are even, and the panacea for labor troubles is not to be found even under their form of government.

Italy, and more recently France, discovered a new method, that of calling the railway men into the army reserve; a temporary expedient, offset by obstructionism, or the recall of the minister of railways, both of which teach the official in authority, or his successor, to be more liberal.

There is nothing to be gained, apparently by criticizing our labor organizations or their leaders. The organizations are numerically greater than the railway managements and have more time and greater disposition to criticize the railways and their managers than the managers have to criticize them. This exchange of mutual regards—or disregards—is prolific of disloyalty, and gets the public into the controversy at the wrong place—where its corns will be trampled on—and it is apt to hit the first offender it can reach, which is generally the railway.

We must find the cause of the existing conditions before we attempt the remedy. Commercial strife follows closely the law of nature, "the survival of the fittest." As we are at present constituted, during the process of converting raw material into the universal medium of exchange—money—we will each take for his share as great a portion as we can get, whether it be the producer, the carrier, the manufacturer or the merchant. This has always obtained, and always will. It was formerly taken by force; then under social regulation, by law, which is considered more equitable. We have never been satisfied with a sufficiency; and we must judge the future by the past. Therefore, how the division shall be made will continue to be determined by intelligence, energy and avarice. Some call the desire of each to get his fair share—or most—laudable ambition; and success in getting it, luck, brains, brawn, cunning, or even stealing. "A rose by any other name would smell as sweet." Whenever in social, political or commercial life the individual succeeds he is applauded or assailed, according to the viewpoint of his critics.

In the recent controversies over rate increases it was made manifest to the railways that no matter how fairly, intelligently or justly they set forth their claims for a share of the increased prosperity of the country, the powers that are created by the people must consider the subject only from the viewpoint of public sentiment. The only real question that seriously entered into the controversy at any time from the standpoint of the railways was, "Does a rate advance mean prosperity or continued depression?" Those broad of vision knew it meant prosperity, and were disappointed with the railway men—perhaps for selfish reasons—because prosperity was deferred by the decision. The result has taught the railways that they need more power politically, whether it come from their own employees or from those who sympathize with them because they know that unless the railways prosper the material growth of the country will be checked.

The influence of employees on the side of the railways can be obtained permanently in only one way—by profit sharing. When a large portion of the employees can be induced to identify themselves financially with the roads, looking to their profits for better living conditions rather than to wage increases or overtime perquisites, the infliction upon the railways of personal injury compensation laws, or the crumbs gathered from the operation—regulative monstrosities produced through their legislative committees, there will undoubtedly come about a change in conditions. Where one employee in a thousand now watches the expenditures there will be at every station, on every train, and at every machine those who will demand and compel from their fellows thrift, honesty and loyalty. There will be those in every community who will watch the ballot and see that candidates inimical to their interests are relegated to political obscurity. There will be those on the jury who will say, "Hold! this is an attempt to obtain money under false pretense." There will be newspapers that will give the railways the credit due them for efficiency. There will be ministers in the pulpit who will preach the righteousness of one moral law for all their congregations. The ambulance chasers will be following agricultural pursuits, or earning their bread otherwise by the sweat of their brow.

"A house divided against itself must fall." No business can prosper under the conditions obtaining on the railways, and under the conditions inflicted upon them. The personnel of the railways should be actuated by the same motives from the bottom to the top. Voluntary loyalty, alert, aggressive and intelligent, ready to meet any enemy from whatsoever source it may appear; voluntary efficiency, voluntary courtesy, voluntary diplomacy, these are what are needed; and they can be produced only by self-interest.

The hundreds of millions of dollars paid in recent years to

railway employees as increased compensation have been absorbed by extravagance and the imposition of high living prices, not justified in any way. If in some way an equal amount of financial interest in the properties had been secured by employees it would have been guarded more jealously; economy and thrift would have been inculcated, and an entirely different atmosphere would prevail, both in the service, and politically, so far as the railways are concerned.

To bring about the ownership by employees of such an interest in the railways is within the range of possibility. To obtain as good results by compulsory arbitration is absolutely impossible. A court of compulsory arbitration may be established. It is so impracticable, however, as to be almost chimerical. If established it will strain the relations existing between employer and employee to the breaking point, and force government ownership and operation of the railways.

VICE-PRESIDENT.

THE EFFICIENCY OF RAILWAY EQUIPMENT.

Kansas City, Mo., April 28, 1911.

To the Editor of the Railway Age Gazette:

In dealing with the subject of equipment efficiency, consideration must be given to the factors that limit performance. The principal factors which may be classed as uncontrollable are the average haul, the minimum load, demurrage rules, unbalanced traffic. Improvement in equipment efficiency must be made independently of the limiting factors. The remedial agents on which reliance must be had are proper facilities and maintenance thereof, improved handling through terminals, organization, supervision, check of operations.

In analyzing operations one is prone to take figures at their face value and disregard contributing factors. Thus, statistics are often based on total results without considering the individual units. In the particular instances pointed out in the editorial on "The Efficiency of Railway Equipment," in your issue of April 7, disproportionate increases in the ratio between tractive power of locomotives and tons moved one mile can probably be traced to large purchases of locomotives between 1902 and 1907, made on the theory that business would continue to increase, or at least would not decrease. Smaller engines, which were not large enough to use economically or to command a ready sale and which were too good to scrap, were kept in stock. The experience of the Kansas City Southern is probably that of many other roads. In 1905, 1906 and 1907, 100 per cent. of all the engines owned were in work stock, while in 1909 and 1910 but 66.1 per cent. and 70 per cent, respectively, were in work stock.

A comparison of total locomotive tractive power and total tons moved one mile is only of relative value. Conditions surrounding the handling of traffic on the individual roads must be known. Statistics frequently indicate poor operation, while, in fact, the best possible results are being secured. Thus, it may be shown that, while the average tractive power per locomotive and the locomotive tractive power per mile of road have increased greatly, the average tons per train, the ton mile per freight locomotive, the ton mile per pound freight locomotive tractive power do not show corresponding increases. It is unfair to assume that operations have been poor until conditions of traffic are known, and what part of total available engine efficiency was used.

In the years under consideration, the average tons moved per loaded car mile did not keep pace with increase of average carrying capacity per freight car. This is due to rapid increase in heavy capacity cars and decrease, through destruction and wear, of light capacity cars. The increase of the average car load, because of limitations mentioned, has been small. Probably few, if any, freight cars have been built for railways since 1902 of less than 30 tons capacity, while the greater part of the cars worn out and destroyed were of smaller capacity. The rapid increase in the average weight of freight cars has decreased the efficiency of locomotives and the apparent efficiency of freight equipment. On some roads, where rapid increase has been made in capacity and weight of cars, ratio of weight of load to weight of car is more nearly equal, whereas on roads where the percentage of heavy capacity cars is small the ratio of load is much greater. On the Kansas City Southern in 1910, of the total average weight of car and contents, the average weight of car was 44.2 per cent., and the average weight of load, 55.8 per cent.

Immediately following the panic, freight equipment deteriorated rapidly, and it has not been properly maintained since. Compared with the corresponding period preceding the panic, fewer freight cars were purchased than during the three years following the panic. The cars now owned, on account of their getting older, are not in as good condition as they were in 1907. The percentage of bad order cars is too great. Before the panic, demand for all classes of cars was so great it could not be supplied, whereas, since the panic, a large number of cars have been stored on account of lack of demand. During the past few months business has fallen off in this section of the country and the roads are hurrying home surplus foreign equipment. On this road, alone, more than 5,000 empty cars have been hauled to connections during the first three months of the current year.

It is believed much of this economic waste could have been prevented by the use of a universal home route card. Several attempts have been made to arouse interest in the home route card during the past four or five years, but as the pooling of equipment in some form seemed imminent, the universal home route card did not meet with much favor. It is now under consideration by the Car Service Committee of the Association of Car Accounting and Transportation Offices. If put into use it will, without doubt, reduce delays to cars on foreign lines and increase performance.

An important factor influencing car performance, especially in this growing southwestern country, is the great increase in industrial and terminal switching. On this road switching of this class has increased in three years at Kansas City, 35.4 per cent., at Shreveport, La., 44 per cent.; at Beaumont, Texas, 52 per cent., and at Port Arthur, Tex., 100.6 per cent. An increase in industrial switching decreases the average miles per car per day. But few cars handled in industrial switching make mileage. The country west of the Mississippi river is developing rapidly. Territory, which a few years ago was local, is now competitive and requires a larger number of cars to take care of the same amount of business.

During the car shortages prior to 1908, patrons loaded cars more nearly to full carrying capacity, in order to dispose of the greatest amount of commodities. Because of inability to get proper equipment nearly any kind of a car was loaded. Since the panic there has been a surplus of all classes of cars at different times, and a surplus of some classes of cars nearly all the time. Because of unsettled conditions since 1907 commodities are bought in smaller quantities and at minimum weights. Notwithstanding the increase in carrying capacity of cars the average load of lumber, the chief commodity of this road, decreased from 24.5 tons in 1907, to 23.8 tons in 1910.

The decreases in the average car load suggest that probably the railways have increased the carrying capacity of cars, and consequently their weight, more rapidly than conditions warrant.

A few years ago an investigation was made to determine whether the 30-ton or the 40-ton box car was the more economical in which to handle box car traffic on a certain trunk line. It was found that the average load, exclusive of merchandise, placed in the 40-ton car, utilized less than one-half of the carrying capacity, and the average load placed in the 30-ton car utilized slightly less than two-thirds of the carrying capacity. As the light weight of the 30-ton car was four tons less than that of the 40-ton car, and the former was strong enough to stand the strain of the heavier trains, it was figured that if all box car freight was handled in 30-ton cars there would be a yearly saving, alone, of more than $300,000 in cost of hauling excessive car weight. Interesting figures bearing on this subject were made several years ago by officials of the Erie and the Lackawanna.

Under normal conditions an important factor in performance of freight equipment is the average haul of the loaded car. It is not always realized that mere figures representing average miles per car per day do not always reflect car efficiency. A road whose average is twenty-five miles per car per day may be rendering more efficient service than a road whose average is fifty miles per car per day.

A number of attempts have been made, without success, to increase the minimum car load. The operating and traffic departments are not always in accord as to what these minimums should be. A number of states either have laws or orders of state commissions prescribing the minimums. Railways themselves are responsible for a number of low minimums. It is believed that some progress is being made, but not much can be looked for in the immediate future.

One of the deterring influences on car efficiency is delay in loading and unloading. These delays are legalized by demurrage rules, by orders of various state commissions and by state laws. It is doubtful if much can be done toward reducing these delays in the immediate future. It will probably take several years of commercial activity to make a beginning. One objectionable feature of present car service rules is the average agreement, in that it does not stimulate release of cars. Not nearly as good service is now being secured from large shippers as was secured before the adoption of the average agreement.

Unbalanced traffic is a feature greatly affecting car performance, which is given but slight consideration. Statisticians usually consider the movement of traffic in relation to direction only, regardless of the fact that it may be different on different divisions. The freight district is an operating entity and should be so considered in determining the effect of unbalanced traffic upon operating economy and equipment efficiency. Direction, on roads where the flow of traffic is subject to changes, should be disregarded.

Two very essential things in successful operation are good power and good track. Railways never made money by neglecting either. They may borrow from the future by deferring necessary repairs, but for this neglect they pay dearly. Many roads are too poor to be economical. Because of the desire to make operating results fit financial statements, the condition of track and equipment is frequently neglected during the last few months of the fiscal year. When work is finally begun an inferior grade of men must be taken; equipment is not put in proper shape with sufficient promptness for the increase of business in the late summer and early fall; work is carried forward during the fall and winter when the days are colder and shorter and the cost of production materially greater, and at a time when all equipment should be in active service. It is believed that an improvement would result if the fiscal year were made coincident with the calendar year.

It is necessary that equipment be put in proper shape by the time business moves in the early fall. Unless this is done there will be a lagging in operations which cannot be overcome during that season. Poor power means increased cost because of engine failures and the necessity of running lightly-loaded trains and light trains to relieve engines that have failed.

As a rule, performance of equipment is fairly satisfactory between terminals. The speed of trains on road is a negligible factor in average miles per car per day. On railways which have a fairly uniform gradient on an individual freight district a high percentage of car and locomotive efficiency is secured. More than 75 per cent. of delays occur in yards and terminals. Notwithstanding, conditions are better than a few years back, but there is still room for improvement. Sufficient force of proper caliber, good facilities and comprehensive reports are necessary for terminals and larger stations, and there good supervision must be had. It has been only a few years since operating reports, except those showing loads and empties to be moved, were not received from larger stations because of the labor involved, notwithstanding that a large terminal usually has more cars than a freight district. Lack of proper facilities at terminals and larger stations not only decrease the efficiency of locomotives and cars, but increase operating expenses. On nearly every road may be seen examples where $35 per day is saved by taking off a switch engine and $50 per day expense caused by resulting per diem and overtime.

Perhaps the greatest results in equipment efficiency will be secured through proper organization and supervision. It is believed that better performance will come through strong divisional organizations rather than through the general offices. This organization should be sufficiently large to permit of thorough supervision of all operations. Better service can be secured by working from the bottom up than from the top down. The division should be equipped with competent officers who should handle the details and in whom full confidence should be placed. The handling of details by the general officers dwarfs the division officers and lessens their efficiency. It is better and more economical to have too large a force than too small, as there should be elasticity in every organization.

In the matter of operations no system will be efficient unless there is proper supervision. The simple issuing of instructions will not suffice. The matter must be closely watched. On the average railway too much is taken for granted and not enough care is exercised to see that instructions are understood and obeyed. The supervising force should be sufficiently large to visit at short intervals all the employees having to do with operations to see that instructions given them are fully comprehended and obeyed. This should be made a matter of routine. In supervision the average railway is weak in that there is not enough of it. Too much dependence is put upon reports. Many operating officials receive more reports than can be looked over in half a day and keep a large number of records of current operations that do not "turn a wheel or earn a dollar." More satisfactory results can be secured from fewer reports and better supervision. Proper supervision contemplates an examination at stated times by experts or officials of other roads who are not familiar with the property and can judge of the operation from an unbiased standpoint. The official who is on the ground is very often too close to the work to get the proper perspective. A great deal of supervising efficiency is wasted through the old but revered custom of "putting it up to the other fellow." Explanations should not be exacted for every deviation from the normal. It should be sufficient to point out the error made and, if circumstances warrant, outline the proper procedure. Criticism presupposes knowledge and should not be indulged in unless the proper way can be pointed out. The supervising officer, by precept and example, should nullify the old saying that railroading is the art of evading responsibility.

There is a lot of unnecessary work and useless correspondence on railways which is not tolerated in any other business. Operation is always in a state of incompleteness and always presents vulnerable points of attack. Delays will always occur. Demands for explanations and solicitation of complaints should be eliminated. This class of correspondence should be sent to the operating official on the firing line only in exceptional cases, as it produces no good results and takes up time that could be better spent.

The operating official being responsible for net revenue feels called upon to make reductions when business shows a marked decrease. At these periods the mistake is often made of reducing the supervising force. The reduction of expenses to the minds of many consists of cutting some one off the pay roll regardless of consequences. Real economy can often be effected by increasing the expenses.

A daily check of operations should be made by the division officer to determine costs. This can be done cheaply and effectively. On this road a report is made each day in each dispatcher's office showing the cost of handling one hundred tons one mile the previous day in the direction of the prevailing traffic.

C. C. RILEY,
General Superintendent, Kansas City Southern Railway.

SIGNAL ASPECTS.

CHICAGO, April 29, 1911.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The arguments set forth in Mr. Rudd's criticism of my Canadian Railway Club paper, which appeared in your issue of April 14, page 893, are so plausible and so attractive to the reader who has not the time to study and digest them, that I desire to make a brief reply in order to assist those interested in arriving at a true understanding of the actual conditions. Mr. Rudd cites three conditions, or cases, in which the minority's recommended scheme of signaling is held to be insufficient and inadequate. These criticisms are worthy of fuller explanation.

The first reads as follows:

"In view of the change in operating methods in the twelve years since Mr. Rhea first promulgated the proposal the minority is now advocating, while granting for the sake of argument that the proposal was sound and adequate for our needs twelve years ago, some of us feel that it is not sufficient for present day requirements. To cite examples: First, given a dense, slow, heavy freight traffic, interspersed with a number of high class, high speed passenger trains scheduled for a stretch of perhaps 15 miles at 75 to 80 miles an hour. A safe braking distance, allowing for all foreseen contingencies, is, say, 1½ miles, but blocks of this length are too long for the operation of the freights, as it would certainly tie up traffic to require the slow freight to reduce speed to the rate required if it were to take a No. 10 crossover and move into an occupied yard at the signal 1½ miles from the point of obstruction; but if the first signal indicated *'Pass next signal at medium speed,'* and the second signal indicated *'Prepare to stop at next signal,'* the requisite information would be given and the blockade avoided."

The schedule speeds named are considerably faster than have previously come to my notice. There is substantial reason for belief that a mile is sufficient braking distance on level track for all speeds that it is *necessary* for passenger trains to run to meet their schedules. This is perhaps, aside from the point, however.

It is stated that, "it would certainly tie up traffic to require the slow freight to reduce speed" at a caution signal 1½ miles from the interlocking where the train is to leave the main track and enter an occupied yard, to such speed that it could enter this same yard at this same caution signal; and, further, to require it to run for the 1½ miles at such reduced speed. If this were necessary the statement might represent the facts. The question is, Would the minority's simple scheme of signaling require such operation of freight trains? We say, No; that such handling is not necessary and was not contemplated by the minority's plan.

We hold that a train finding a signal in the caution position must run with such caution as the conditions require. Mr. Rudd seems to hold that a train finding a caution signal located under the most favorable conditions must run with the same degree of caution and restriction of speed required by the caution signal located under the most unfavorable conditions on the division. We feel that this interpretation of the caution signal is incorrect and indicates a lack of confidence in our enginemen and trainmen. If our enginemen and trainmen can be trusted to run trains at all, they certainly can be trusted to run with the necessary caution when they find a caution signal. This is subject, of course, to proper education, instruction and discipline which must be had for safe operation with any system. It seems idle to say that because the conditions at one caution signal require a reduction of train speed to, say, 4 or 5 miles an hour, and unusually careful handling, that trains must be similarly handled at every other caution signal on the division regardless of much more favorable conditions existing. If this statement is true (and every practical railway man will agree that it is), the blockade of traffic that Mr. Rudd refers to is unlikely to occur. Summing up the situation referred to, we feel that the freight trains can be handled under the conditions outlined as fast as safe operation and terminal facilities will permit, regardless of whether fast passenger trains are run over the same tracks or not.

The second case specified reads as follows:

"Given a road in which permissive block is used for freights and absolute for passenger trains, either class of trains may accept, as per rule, the caution (distant) indication, but the passenger train cannot pass the caution (permissive) signal and enter an occupied block. Should the engineman be required to remember all the points at which the caution signal is located which he cannot accept, or is it preferable to designate it so that he can tell what it is by looking at it? Which practice lends itself better to the enforcement of discipline and which to the promotion of misunderstanding?

"Further, with the minority scheme, if the interlocking plant is in permissive manual block territory, advance signals are compulsory, as otherwise the caution position may indicate either block occupied, on one or two tracks; a movement against traffic; into a yard, or to a branch, and while a passenger train would be permitted to accept it for the latter purposes, it could not accept it for the former. How would the engineer differentiate without stopping and examining the position of switches, etc.? Is this a good way to facilitate traffic?"

I take it that this refers to operation in manual block territory. We feel that no confusion will arise at the ordinary block station, because passenger trains are operated only on positive block and freight trains on both positive and permissive block. This is a common practice over the country, and no bad results seem to arise from the practice. Both the block operator and the train crews in charge of passenger trains are fully conversant with the practice and no difficulty is met today with this manner of operation.

At interlocking plants which are also block stations, the situation is a little different. At such points we may desire to give passenger trains a caution signal for diverging movements, but not for entering an occupied block section. This is easily taken care of by the location of a signal for block and train order purposes at some point beyond or in advance of the diverging switches. As a rule this will not increase the number of signals employed, as it is common practice to install and use at such points, for block and train order purposes, signals located either in advance of the switches or in front of the tower. Further, it should be borne in mind that such advance signals are required only on lines of heavy traffic, where it is desired to clear the block in the rear, as soon as possible after the arrival of the train at interlocking plant. To simplify the apparently difficult problem propounded, I may say without hesitation, that the conditions can be met with the minority's simple plan and are now being met without the use of the complicated scheme of signaling advocated by the majority.

The third case is rather formidable on first reading:

"Given a four track railway handling all classes of traffic and the problem of weaving fast expresses in and out to pass local passenger and freight trains on the outside tracks and tonnage trains on the inside tracks, these expresses scheduled 77 miles in 89 minutes, with two or three slow-downs for water and one and sometimes two station stops. Place interlockings about five miles apart with No. 20 crossovers maintained for a speed of at least 50 miles an hour without danger or discomfort to passengers. Is it good signaling or good railroading to give no advance information to the engineer of the conditions at the interlocking, but to require him when he comes in sight of a signal located perhaps a mile from the home signal, to immediately reduce speed, watch his track for obstruction ahead, misplaced switch, train in block or bad track, moving at this rate to the interlocking signal, passing it prepared to stop if he is diverted over against traffic or into a yard, and to crawl along at this rate for 2,000 ft. more until he reaches the advance signal, if there is one, and in its absence, so run clear through the next block? Or is it better to tell him definitely the condition of the interlocking signals and switches and let him run, especially when he may be crossed in and out three or four times on the 77 mile run?

"If the minority standpoint is correct, why make a distinction between the main or high speed and the low speed, when you make no distinction between the medium speed route (good for 45 m.p.h.) and the low speed?

"Is the providing of these long crossovers a waste of money? If it is bad practice to so signal that they may be taken at speed, why put them in? They certainly cost more than the shorter ones, No. 8 or No. 10. Or is it intended that the engineman shall 'use his judgment' and, having received the low speed signal, run them at medium speed, having decided that, because that is usually the route set up, it always will be right, and having good luck until some day he is sent into a yard by mistake?"

A brief study will indicate that the difficulties are perhaps over-estimated. For example, the taking of water two or three times in 77 miles is, I believe, now generally considered unnecessary. It is common practice at the present time to run 75 to 100 miles betwen water stations. Since reading the criticism by Mr. Rudd, some consideration has been given to the schedule on the division of which I have charge. This has resulted in further confirming and reinforcing my previous opinion that the schedule described in case 3 is not unusual and not especially difficult to meet, with the use of the simple scheme of signaling, "Stop," "Caution" and "Proceed" advocated by the minority. If time is taken to translate the description of conditions into ordinary language used by operating men of the day, it is probable that many will find that they are, with a very simple system of signals, obtaining results which the language in case 3 would indicate could not be obtained without the use of the complicated scheme of signals recommended by the majority. The results of long experience have been to show that it is unnecessary, if

not undesirable, to require or permit trains to run at excessive speeds over diverging routes at interlocking plants. To make such excessive speeds possible requires, in the first instance, the installation of adjuncts and additions to a simple system of signals, which must be accompanied by expensive and complicated electric locking circuits, approach locking annunciators, releases, time locks, etc., to check and guarantee the more or less specific information which it is aimed to give the enginemen.

These adjuncts and complicated automatic checking devices are expensive to install, maintain and operate. They are subject to failure and do fail, in common with all automatic devices.

L. R. CLAUSEN.

THE SUPPLY DEPARTMENT.

BY E. J. MC VEIGH.

Storekeeper, Grand Trunk Railway.

It has long been recognized that there are two sides to any question, and in looking over H. C. Pearce's articles on "The Supply Department," beginning in the January 6 issue of the *Railway Age Gazette,* it has occurred to me that the other side of this question should be presented. Perhaps it might be better to say that we should have a look at the picture from a different angle.

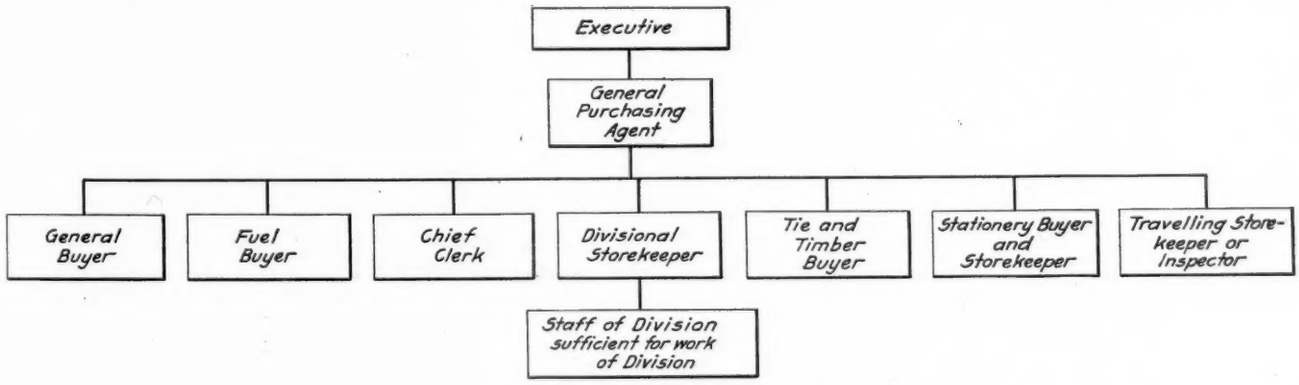
Mr. Pearce has given us a little history showing how things came to be as they are, and no one will question his statements. We all know that our railways "just growed," and are still growing. Like the trees of the forest, they look much alike from a distance. But a close inspection will show that no two are exactly alike, and that few indeed are perfect. "As the twig is bent the tree is inclined," and most of us are so busy just growing that we have had little time to devote to taking out the kinks.

In writing on a subject of this kind the average railway man finds it very hard to get away from his own environment, and most of our writings are little more than a description of our own methods, and what we have been accustomed to. This is natural; indeed, it is almost inevitable. But this does not render such writing of no educational value; for while it does not always show you just how to do it in the best possible way, it may give you the idea of how *not* to do it; and this is of value. For we can hardly know what a thing is like until we have had a look at it, just as we sometimes do not really know what our ideas are on a given subject until we put those ideas into words, and hear how they sound.

I think we might be safe in saying that the present organization of the supply department on most of our roads is the result of accident more than of original design. And as we are all as yet in a state of transition, there is surely room for difference of opinion, especially as we have not yet arrived at the point where we can make intelligent comparison of results, and thus learn what method is the most perfect, and what organization we require to get us the best results.

It has taken our railways many years to learn that the division superintendent is the real unit of the operating department; in other words, that the man on the ground, if he is fit for his job, is the best man to handle the work. Is there no lesson here for the supply department? The shortest distance between two points is a straight line from one to the other. The purpose of the supply department is to procure, and to place in the hands of the people who actually use it, the material necessary for the economical operation of the railway, and to do so in the most direct manner with the least possible cost. Do Mr. Pearce's plan and organization, as outlined, do this?

There are certain large items of material, such as steel rails, steel bridges, etc., that all railways use, and these are handled by each in its own way. We are here dealing with the general supplies, and we will try to begin at the bottom and work up, this being the generally recognized method of progression followed by the human animal when making progress. Now, by whom is the material required? By the man who is to use it. He is in one of the departments on a division. He goes direct, or indirectly, to the head of his department with his list of material, and, if the head of the department has been authorized to proceed with the work, he makes a requisition, on the executive for the supplies. If the executive has decided to curtail expenditures temporarily for any reason, the requisition is returned with orders to discontinue the work. If, on the other hand, the executive approves the requisition, it is up to the supply department to place the material in the hands of the people who are to use it, with the least possible delay and cost. What is the best way to do this?



Supply Department Organization.

Under Mr. Pearce's plan of organization, the requisition would now go to the official in charge of the material and supplies, from him to the general storekeeper, from the general storekeeper to the assistant general storekeeper, from the assistant general storekeeper to the division storekeeper, who would supply what he could from stock, and then make requisition on the general storekeeper for the balance. The general storekeeper, through the assistant general storekeeper, would supply what he could and make requisition on the purchasing agent for the rest. The purchasing agent would buy the items and send them to the general storekeeper who would, through the assistant general storekeeper, send them to the divisional storekeeper, and he would put them in the hands of the men waiting for them. If the material was to be manufactured in company's works the procedure would be the same, except that the order would go to the factory, instead of to the purchasing agent. And, if this has all been done systematically and in order, the general storekeeper has been charged with the value of the goods, he has, through the assistant general storekeeper, debited the divisional storekeeper; and the divisional store-

keeper in turn has charged them out to the proper account.

Can we say that there is no suspicion of circumlocution or duplication of work, here?

Keeping in mind the fact that our railway systems are now operated by divisions, and that the tendency is to go even further in making each division stand on its own feet, recognizing the fact that the man on the division is the one best qualified to do the work of the division, would it not be more consistent to have the requisition go from the executive to the divisional storekeeper; his requisition go to the purchasing agent, or factory; and the material go direct to him, and from him to the user?

What do we gain by the roundabout method, or lose by the more direct plan? May not we claim that when the requisition has gone through the hands of the head of the department, the executive, the purchasing agent and the divisional storekeeper, it has been handled by all of those interested? If so, why continue its wanderings, causing duplication of office work and double handling of material? If may be, and very often is, the case, that the material can be purchased right where required to be used, and this may be a thousand miles from the general storekeeper's supply depot. It is quite as simple for the purchasing agent to order delivery direct to division, as to general depot.

It has been found that it costs our railways, apart from the purchasing office expense, 5 per cent. of the value of the material to handle it through the hands of one storekeeper. That is, it costs that for a storekeeper to requisition, receive, distribute, and account for the material. If this be done a second time, it adds an additional 5 per cent. Now, a railway system of 6,000 miles will use, approximately, $1,500,000 worth of material for maintenance each year; 10 per cent. of this is $150,000. Will it not save half of this by using a shorter and more direct method?

Mr. Pearce carefully outlines the duties or functions of the general storekeeper, but has he any duties or functions that are not a duplication of the divisional storekeeper's work, down to his unit of efficiency? And if we recognize the principle that the man on the ground is best qualified to do the work, why cannot the divisional man do it much detter than the general man? The claim that the general storekeeper is the man best qualified to cut off quantities requisitioned for, will, I am afraid, be disputed by 90 per cent. of our railway officials. The less "cutting off" a man in a general storekeeper's position attempts the better for himself and his railway. This reducing of quantities on requisitions by parties having no actual knowledge of circumstances or conditions has cost our railways, in delays, loss of time by men, and equipment out of service, a hundred fold more than the value of all the material they have successfully "cut off." It is true that this is not always brought to the light, as it should be, but the men inside know that it is a fact. The theory is alluring, the practice is ———.

The only way this may be done successfully is when it is done by the executive, and the work stopped when supplies are stopped. The general storekeeper cannot do this. As to general stocks, the only way to keep them within bounds is to know what is a reasonable stock for a division, keep a close check on the divisional storekeeper by inventory, and by percentage of disbursements to permanent stock carried, and when these are not reasonable get another man. The executive and the auditor of disbursements can keep the check.

While we are on this question of permanent stocks, let us go a little further into it. If we have a railway of 6,000 miles, divided into, say, eight divisions, with each division maintaining a stock of material and supplies necessary to the successful and economical operation of that division, why maintain a general supply depot, duplicating the division stock when, or if, the division stock may be renewed directly and more cheaply than through the central depot? On such a railway the value of the stock on hand on each division will average $150,000, making a total of $1,200,000. To be of any real use in replenishing the stocks on divisions, the stock at the general stores would have to be of a value of $400,000. This increases our stock for the system by that amount. The question to be answered is to what extent our railway system will benefit by increasing the permanent investment by $400,000 and the cost of handling supplies by 5 per cent.

It is true that by buying for each division separately the detail work in the purchasing agent's office will be slightly increased. The purchasing agent may, at times, make eight orders under this plan whereas he makes only one if the general storekeeper's staff compiles the divisional requisitions. But is this serious? Let us suppose that, instead of receiving the requisitions from the general storekeeper for all the divisions in bulk, the purchasing agent received them from each division separately. He would compile them for the purpose of sending out his inquiries, thus getting the benefit of buying in bulk, and separate them again in making his orders. Not a very great amount of clerical work would be involved, and he could place his orders at the point nearest to where material was required, consistently with prices, and often save long haulage, besides distributing the road's patronage and making friends at all points on the system. It is not necessary to point out that friends are a valuable asset—never more so than right now. And their value will not diminish.

It might be claimed that the general supply depot is necessary in connection with the chief manufacturing plant on the system. Is this the case? On each division the main shops do more or less manufacturing, to the order of the divisional storekeeper, and it is seldom that it is found convenient, or advisable, to have all the main factories of a system at one point; and, in any case, no matter where the factory is situated, would it not be a simple matter to put it in charge of the storekeeper on whose division it is?

All divisional stores would not be of the same importance, just as all divisions would not be of equal importance in other respects. But if each divisional store is looking after the needs of the division on which it is situated—and it must do this under any workable plan—why is a general store or depot to supply them all needed, when the source of the supply is as much open to the division store as to the general store?

It is quite true that it is not so many years since we had no supply department at all. But in attempting to remedy this it is possible that we have gone a little too far in some cases, and got too large a department. This is a question the future must decide. But in the meantime, we cannot get away from the fact that the division as the unit of the railway is our basis of operation. Our executives tackle their problems by divisions. There are, of course, questions of general policy into which, as such, the division may not enter. But in questions of operation the divisions are dealt with separately, and would it not be natural and convenient for the executive to deal with the supplies of the division along with its other problems, rather than have them mixed up with that of other divisions coming through a central supply depot? There must, of course, be a head to everything. In the case of the distribution of railway supplies why should not this be the purchasing agent, with the markets of the world to draw from direct, rather than a central depot, which, in spite of the enormous expense attached to it, never has succeeded—and never can succeed—in doing this without delays and duplication of labor and expense?

It is true that when the railways first appointed purchasing agents they were only clerks, without knowledge of material and supplies. The reason for this was that men of ability with this knowledge were not available at that time. This is not the case today; we now have men of this class; and surely it would be wise to make use of them, and get the benefit of their training and knowledge. But, with or without practical knowledge, no purchasing agent of a large railway system can personally attend to the details of all buying. He must delegate

this to members of his staff, a portion to each, and it naturally follows that he will give certain lines to certain men. We might consider the organization of the supply department as shown in the diagram as a direct and compact whole.

It would seem futile to go further with a diagram of organization when suggesting an organization for railways generally, as the staff required on the division will depend on such circumstances as its length, general importance, and the shops and factories situated on it. This also applies to the size and style of the stores buildings, and even to the material and supplies carried in stock, to a greater or less extent. For the class and quantity of material carried by a division on which was situated a large manufacturing plant would differ much from that required to be kept in stock on a division where there was no such plant. On one division there may be a shop for building new locomotives or cars, while, on the next, repairs only are done. Would not all this make it desirable to deal with supplies by divisions? The divisional man must know his business or he is of no use, and how does he benefit by having a general storekeeper between him and the source of supply?

In the organization herein suggested, it is hardly necessary to say that fuel inspectors would report through the fuel buyer, and timber men through the timber buyer, while the traveling storekeeper would report to the general purchasing agent. The stationery buyer, I think, should be stationery storekeeper also. And it would seem advisable that the general buyer, fuel buyer, timber buyer and chief clerk, who would be accountant, should do business in the name of the general purchasing agent, while the divisional storekeeper, traveling storekeeper, and stationery man should use their own names. Each of the officials shown would, of course, have a personal staff sufficient for the work to be done; but the chief clerk and general office staff would be used in common by the general buyer, the fuel buyer, the timber and tie man and the traveling storekeeper.

The traveling storekeeper would be the personal link between the different divisional storekeepers, and between them and the head office. When not on the road he would be a member of the general office staff. It might be of advantage to have him scan the divisional requisitions as soon as they come in, and note such items as may be transferred from one division to another, thus assisting in keeping down the total value of stocks. But he would, of course, have this in view and do it at all times when possible. The work of the right man in this position would be of great general value; he would save much time for the general purchasing agent, and would bring in much valuable information to each member of the general staff, saving an enormous amount of correspondence by them, and he would be equally valuable to the divisional storekeeper in keeping him advised of conditions on the division—not relieving the divisional man of his responsibility, but supplementing his efforts.

The securing and distributing of our material and supplies is simple enough; where we are weak is in following them up and seeing that they are properly applied. The division man, right on the ground, finds this to be the case in spite of his best efforts; how little, therefore, could a general man a thousand miles away do to improve conditions.

There can be no question as to the advisability, and even necessity, of carefully inspecting and testing material purchased for railway use, but there may be room for a difference of opinion as to the advisability of loading down the supply department with an engineer and assistants, as well as the equipment he would require to enable him to be of practical use in testing all material. Each department must maintain its own engineering staff to enable it to carry on its work. Would not these men be quite competent to inspect and test nearly every item of material used by their department, and that without extra cost to their company? And the few items that might be considered beyond their ability to attend to may always be handled by a state college at small cost. Is it not a fact that the men actually using the material will discover defects and report them without considering, or caring, how many engineers have passed on them? But this question could hardly be settled without a very careful inquiry into the working of the testing departments of some of our railways to learn if the facts have borne out the theory.

Has not Mr. Pearce, with the organization he advocates, loaded his gun too heavily for the game he intends to bring down? This question of the supply department is no small one, and we all want exact information if we can get it. Is an organization such as Mr. Pearce has outlined necessary, and what will it cost to handle material under such a plan? I think many of us would be glad of an answer to these questions.

FEDERAL BOILER INSPECTION RULES.

At a conference held in Washington on April 25-27, an agreement was reached between the chief inspector of locomotive boilers and his assistants, and a committee of officers of the mechanical departments of the railways, on the subject of minimum rules and instructions for the inspection of locomotive boilers. The Interstate Commerce Commission has ordered a hearing upon these rules and instructions for May 29, 1911, at 11 a. m. Provided these proposed minimum rules and instructions are approved by the Interstate Commerce Commission after hearing, they will be obligatory upon any carrier failing to file its own rules and instructions.

If any carrier desires more frequent inspections or more rigid requirements than those specified in the proposed minimum rules and instructions, such carrier may so arrange or may file its own rules and instructions with the chief inspector of locomotive boilers. It is not necessary, however, under such circumstances to make more frequent reports to the district inspector of locomotive boilers than those required by the proposed minimum rules and instructions, paragraphs 41 and 42.

If these proposed minimum rules and instructions are unsatisfactory to any individual carrier, such carrier may file its own rules and instructions prior to May 17, 1911, and ask for a hearing therupon, under the first paragraph of section five of the act.

The rules agreed on are as follows:

The railway company will be held responsible for the general design and construction of the locomotive boilers under its control. The safe working pressure for each locomotive boiler shall be fixed by the chief mechanical officer of the company or by a competent mechanical engineer under his supervision after full consideration has been given to the general design, workmanship, age and condition of the boiler, and shall be determined from the minimum thickness of the shell plates, the lowest tensile strength of the plates, the efficiency of the longitudinal joint, the inside diameter of the course and the lowest factor of safety allowed.

FACTORS OF SAFETY.

The lowest factor of safety to be used for all locomotives in service or under construction on or before January 1, 1912, will be fixed after investigation and hearing and after the expiration of the time allowed for filing specification cards.

The lowest factor of safety to be used for all locomotive boilers which are constructed after January 1, 1912, shall be 4.

TENSILE STRENGTH OF MATERIAL.

When the tensile strength of steel or wrought-iron shell plates is not known, it shall be taken at 50,000 lbs. for steel and 45,000 lbs. for wrought-iron.

SHEARING STRENGTH OF RIVETS.

The maximum shearing strength of rivets per square inch of cross-sectional area shall be taken as follows:

Iron rivets in single shear	38,000 lbs.
Iron rivets in double shear	76,000 "
Steel rivets in single shear	44,000 "
Steel rivets in double shear	88,000 "

A higher shearing strength may be used for rivets when it

can be shown by test that the rivet material used is of such quality as to justify a higher allowable shearing strength.

RULES FOR INSPECTION.

The mechanical officer in charge at each point where boiler work is done will be held responsible for the inspection and repair of all locomotive boilers and their appurtenances under his jurisdiction. He must know that all defects disclosed by any inspection are properly repaired before the locomotive is returned to service.

The term inspector as used in these rules and instructions unless otherwise specified will be held to mean the railway company's inspector.

INSPECTION OF INTERIOR OF BOILER.

1. *Time of Inspection:* The interior of every boiler shall be thoroughly inspected before the boiler is put into service, and also whenever a sufficient number of flues are removed to allow examination.

2. *Flues to Be Removed:* All flues of boilers in service, except as otherwise provided, shall be removed at least once every three years and a thorough examination shall be made of the entire interior of the boiler. After flues are taken out the inside of the boiler must have the scale removed and be thoroughly cleaned. This period for the removal of flues may be extended upon application if an investigation shows that conditions warrant it, but in no case shall exceed five years.

3. *Method of Inspection:* The entire interior of the boiler must then be examined for cracks, pitting, grooving or indications of burning and for damage where mud has collected or heavy scale formed. The edges of plates, all laps, seams, and points where cracks and defects are likely to develop, or which an exterior examination may have indicated, must be given an especially minute examination. It must be seen that braces and stays are taut, that pins are properly secured in place, and that each is in condition to support its proportion of the stress.

4. *Repairs:* Any boiler developing cracks in the barrel shall be taken out of service at once, thoroughly repaired, and reported to be in satisfactory condition before it is returned to service.

5. *Lap Joint Seams:* Every boiler having lap joint longitudinal seams without reinforcing plates shall be examined with special care to detect grooving or cracks at the edges of the seams.

6. *Fusible Plugs:* If boilers are equipped with fusible plugs they shall be removed and cleaned of scale at least once every month. Their removal must be noted under "Remarks" on the report of inspection.

INSPECTION OF EXTERIOR OF BOILER.

7. *Time of Inspection:* The exterior of every boiler shall be thoroughly inspected before the boiler is put into service and whenever the jacket and the lagging are removed.

8. *Lagging to be Removed:* The jacket and lagging shall be removed at least once every five years and a thorough inspection made of the entire exterior of the boiler. The jacket and lagging shall be removed whenever on account of indications of leaks the United States inspector or railway company's inspector considers it desirable or necessary.

TESTING BOILERS.

9. *Time of Testing:* Every boiler before being put into service, and at least once every twelve months thereafter, shall be subjected to hydrostatic pressure 25 per cent. above the working steam pressure.

10. *Removal of Dome Cap:* The dome cap and throttle standpipe must be removed at the time of making the hydrostatic test, and the interior surface and connections of the boiler examined as thoroughly as conditions will permit. In case the boiler can be entered and thoroughly inspected without removing the throttle standpipe, the inspector may make the inspection by removing the dome cap only, but the variation from the rule must be noted in the report of inspection.

11. *Witness of Test:* When the test is being made by the railway company's inspector, an authorized representative of the company thoroughly familiar with boiler construction must personally witness the test and thoroughly examine the boiler while under hydrostatic pressure.

12. *Repairs and Steam Test:* When all necessary repairs have been completed the boiler shall be fired up and the stream pressure raised to not less than the allowed working pressure, and the boiler and appurtenances carefully examined. All cocks, valves, seams, bolts and rivets must be tight under this pressure and all defects disclosed must be repaired.

STAY-BOLT TESTING.

13. *Time of Testing Rigid Bolts:* All stay-bolts shall be tested at least once each month. Stay-bolts shall also be tested immediately after every hydrostatic test.

14. *Method of Testing Rigid Bolts:* The inspector must tap each bolt from the firebox side and determine the broken bolts from the sound or vibration of the sheet. If stay-bolt tests are made when the boiler is filled with water there must be not less than 50 lbs. pressure on the boiler. Should the boiler not be under pressure, the test may be made after draining all water from the boiler, in which case the vibration of the sheet will indicate any unsoundness. The latter test is preferable, and it is recommended that the boiler be under not less than 50 lbs. air or steam pressure during the test.

15. *Method of Testing Flexible Stay-bolts With Caps:* All flexible stay-bolts having caps over the outer ends shall have the caps removed at least once every eighteen months, and also whenever the United States inspector or the railway company's inspector considers the removal desirable in order to thoroughly inspect the stay-bolts. The firebox sheets should be examined carefully at least once a month to detect any bulging or indications of broken stay-bolts.

16. *Method of Testing Flexible Stay-bolts Without Caps:* Flexible stay-bolts which do not have caps shall be tested once each month the same as rigid bolts, and in addition shall be tested once each eighteen months by means of a plug wrench and a bar, sufficient pressure being applied to determine if the bolt is broken.

17. *Broken Stay-bolts:* No boiler shall be allowed to remain in service when there are two adjacent stay-bolts broken or plugged in any part of the firebox or combustion chamber, nor when three or more are broken or plugged in a circle four feet in diameter, nor when five or more are broken or plugged in the entire boiler.

18. *Telltale Holes:* All stay-bolts shorter than 8 ins. applied after July 1, 1911, except flexible bolts, shall have telltale holes 3/16 in. in diameter and not less than 1¼ ins. deep in the outer end. These holes must be kept open at all times.

All stay-bolts shorter than 8 ins. except flexible bolts and rigid bolts which are behind frames and braces shall be drilled when the locomotive is in the shop for heavy repairs, and this work must be completed prior to July 1, 1914.

STEAM GAGES.

19. *Location of Gage:* Every boiler shall have at least one steam gage which will correctly indicate the working pressure. Care must be taken to locate the gage so that it will be kept reasonably cool and can be conveniently read by the enginemen.

20. *Siphon:* Every gage shall have a siphon of ample capacity to prevent steam entering the gage. The pipe connection shall enter the boiler direct, and shall be maintained steam tight between boiler and gage.

21. *Time of Testing:* Steam gages shall be tested at least once every three months and also when any irregularity is reported.

22. *Methods of Testing:* Steam gage shall be compared with an accurate test gage or dead weight tester, and gages found inaccurate shall be corrected before being put into service.

23. *Badge Plate:* A metal badge plate showing the allowed

steam pressure shall be attached to the boiler head in the cab. If boiler head is lagged, the lagging and jacket shall be cut away so the plate can be seen.

The builder's number of the boiler, if known, shall be stamped on the dome. If the builder's number of the boiler cannot be obtained, an assigned number which shall be used in making out specification card shall be stamped on the dome.

SAFETY VALVES.

24. *Number and Capacity:* Every boiler shall be equipped with at least two safety valves, the capacity of which shall be sufficient to prevent, under any conditions of service, an accumulation of pressure of more than 5 per cent. above the allowed steam pressure.

25. *Setting of Safety Valves:* Safety valves shall be set by the gage employed upon the boiler, to pop at pressures not exceeding six pounds above the allowed steam pressure, the gage in all cases to be tested before the safety valves are set or any change made in the setting. When setting safety valves the water level in the boiler must not be above the highest gage-cock.

26. *Time of Testing:* Safety valves shall be tested under steam at least once every three months, and also when any irregularity is reported.

WATER-GLASS AND GAGE-COCKS.

27. *Number and Location:* Every boiler shall be equipped with at least one water-glass and three gage-cocks. The lowest gage-cock and the lowest reading of the water-glass shall not be less than 3 ins. above the highest part of the crown sheet. Locomotives which are not equipped with water-glasses shall have them applied on or before July 1, 1912.

28. *Water-glass Valves:* All water-glasses shall be supplied with two valves or shut-off cocks, one at the upper and one at the lower connection to the boiler, and also a drain-cock so constructed and located that they can easily be opened and closed by hand.

29. *Time of Cleaning:* The spindles of all gage-cocks and water-glass cocks shall be removed and cocks thoroughly cleaned of scale and sediment at least once each month.

30. *Water and Lubricator-glass Shields:* All tubular water-glasses and lubricator glasses must be equipped with a safe and satisfactory shield which will prevent the glass from flying in cases of breakage, and such shields shall be properly maintained.

31. *Water-glass Lamps:* All water-glasses must be supplied with a satisfactory lamp properly located to enable the engineer to easily see the water in the glass.

32. All water-glasses must be blown out and gage-cocks tested before each trip, and gage-cocks must be maintained in such condition that they can be easily opened and closed by hand without the aid of a wrench or other tool.

INJECTORS.

33. Injectors must be kept in good condition, free from lime and scale, and must be tested before each trip. Boiler checks, delivery pipes, feed water pipes, tank hose and tank valves must be kept in good condition, free from leaks and from foreign substances that would obstruct the flow of water.

PLUGS IN FIRE TUBES.

34. Flue plugs shall not be used except as temporary expedient to get a locomotive to a point where proper repairs can be made. When used temporarily at outlying points the plugs must be provided with a hole through the center not less than ¾ in. in diameter. Where one or more tubes are plugged at both ends the plugs must be tied together by means of a rod not less than ⅝ in. in diameter. Such plugs must be removed and flues repaired at the first point where such repairs can properly be made.

WASHING BOILERS.

35. *Time of Washing:* All boilers shall be thoroughly washed as often as the water conditions require, but not less frequently than once each month. All boilers shall be considered as having been in continuous service between washouts unless the dates of the days that the boiler was out of service are properly certifid on washout reports and the report of inspection.

36. *Plugs to be Removed:* When boilers are washed, all washout, arch and water-bar plugs must be removed.

37. *Water Tubes:* Special attention must be given the arch and water-bar tubes to see that they are free from scale and sediment.

38. *Office Record:* An accurate record of all locomotive boiler washouts shall be kept in the office of the railway company.

The following information must be entered on the day that the boiler is washed:

(a) Number of locomotive.
(b) Date of washout.
(c) Signature of the boiler washer or inspector.
(d) Statement that spindles of gage-cocks and water-glass cocks were removed and cocks cleaned.
(e) Signature of the boiler inspector or the employee who removed the spindles and cleaned the cocks.

STEAM LEAKS.

39. *Leaks Under Lagging:* If a serious leak develops under the lagging, an examination must be made and the leak located. If the leak is found to be due to a crack in the shell or to any other defect which may reduce safety, the boiler must be taken out of service at once, thoroughly repaired and reported to be in satisfactory condition before it is returned to service.

40. *Leaks in Front of Enginemen:* All steam valves, cocks and joints, studs, bolts and seams shall be kept in such repair that they will not at any time emit steam in front of the enginemen so as to obscure their vision.

41. *Report of Inspection:* Not less than once each month and within 10 days after each inspection a report of inspection Form No....., size 6 ins. x 9 ins. shall be filed with the district inspector of locomotive boilers for each locomotive used by a railway company, and a copy shall be filed in the office of the chief officer having charge of the locomotive.

A copy of the monthly inspection report Form No....., or a quarterly inspection card Form No....., properly filled out, shall be placed under glass in a conspicuous place in the cab of the locomotive before the boiler inspected is put into service.

42. Not less than once each year and within 10 days after hydrostatic and other required tests have been completed, a report of such tests showing general condition of the boiler and repairs made shall be submitted on Form No....., size 6 ins. x 9 ins., and filed with the district inspector of locomotive boilers. The monthly report will not be required for the month in which this report is filed.

43. In the case of an accident resulting from failure from any cause of a locomotive boiler or any of its appurtenances, resulting in serious injury or death to one or more persons, the carrier owning or operating such locomotives shall immediately transmit by wire to the chief inspector of locomotive boilers at his office in Washington, a report of such accident, stating the nature of the accident, the place at which it occurred, as well as where the locomotive may be inspected, which wire shall immediately be confirmed by mail, giving a full detailed report of such accident, stating so far as may be known the causes and giving a complete list of the killed or injured.

44. *Specification of Card:* A specification card, Form No..... containing the results of the calculations made in determining the working pressure and other necessary data shall be filed in the office of the chief inspector of locomotive boilers, for each locomotive boiler. A copy shall also be filed in the office of the chief mechanical officer having charge of the locomotive. Every specification card shall be verified by the oath of the engineer making the calculations, and shall be approved by the chief mechanical officer. These specification cards shall be filed as promptly as thorough examination and accurate calculation will permit. Where accurate drawings of boilers are available, the data for specification card, Form No....., may be taken

from the drawings, and such specification cards must be completed and forwarded prior to July 1, 1912. Where accurate drawings are not available, the required data must be obtained at the first opportunity when general repairs are made, or when flues are removed. Specification cards must be forwarded within one month after examination has been made and all examinations must be completed and specification cards filed prior to July 1, 1913, flues being removed if necessary to enable the examination to be made before this date.

The above rules were agreed to by the following committee representing the railways:

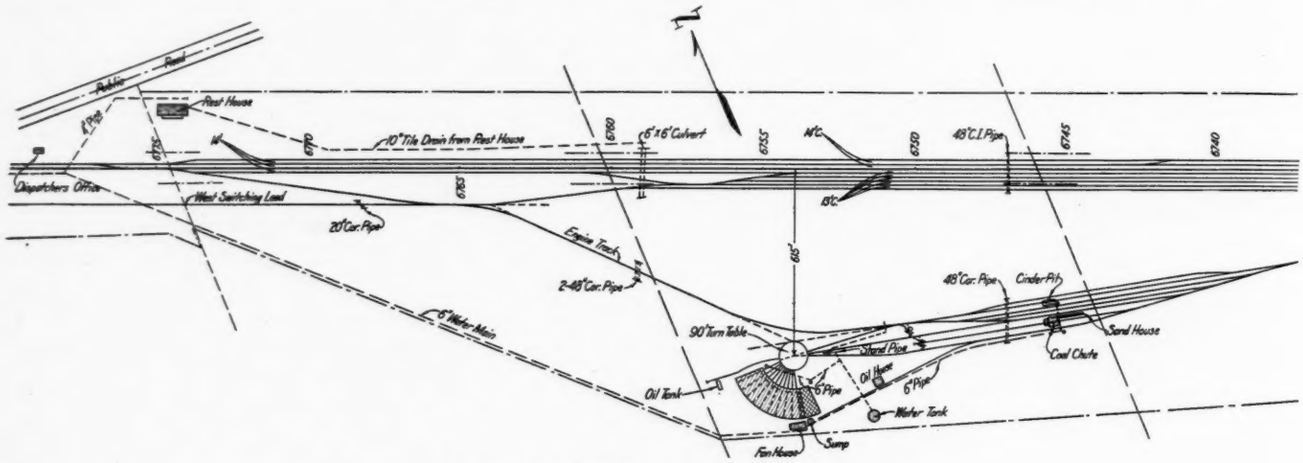
C. A. Seley, T. H. Curtis, C. E. Fuller, D. F. Crawford and D. R. MacBain; by H. E. Wills, representing the railway employees; and by John F. Ensign, chief inspector; Frank McManamy, assistant chief inspector; G. P. Robinson, assistant chief inspector.

GRADE REVISION AND TERMINAL WORK ON THE CHICAGO GREAT WESTERN.

The Chicago Great Western has five main lines on which it handles through traffic—those between Chicago and St. Paul, Chicago and Omaha, Chicago and Kansas City, St. Paul and Omaha, and St. Paul and Kansas City. Although no one of the three lines out of Chicago is the shortest route to the city it reaches, the difference in length is slight in the cases of St. Paul and Omaha and the possible loss of through traffic on account of the extra length of the Chicago-Kansas City line is offset against the heavy local business derived from the territory traversed. From Chicago to Oelwein, Iowa, where the line divides into the three main branches, all the traffic between Chicago and St. Paul, Omaha and Kansas City, is handled over a single line. The maximum grade on this division has been 1 per cent., and the line has been single track for nearly the entire distance. The division is 246 miles long and has been operated as two freight divisions with the intermediate terminal at Fair Grounds, Iowa, two miles west of Dubuque. This made the eastern engine stage 172 miles long, and the western only 74 miles. In order to facilitate the movement of the heavy traffic over this division, it was decided to reduce the maximum grade on the eastern end of the division to 0.7 per cent., add a second track at certain places, and install automatic block signals. In planning for this improvement it was decided to move the engine terminal from Dubuque to Stockton, Ill., making the eastern run 131 miles and the western 115 miles. This change also made it possible to secure the maximum grade of 0.7 per cent. at a much less cost, because the grade from Dubuque to Stockton is heavier than from Stockton to Chicago. At the same time it was decided to use consolidation locomotives east and Mallet locomotive west of Stockton, raising the maximum tonnage from 1,500 to 2,500 tons. This difference in motive power practically equalizes the difference in maximum grades, making it unnecessary in most cases to break trains at Stockton. This, of course, greatly simplifies operation and obviates the necessity of providing a large classification yard at the division point. The first work on the grade revision was begun in November, 1909, and it was practically complete during the season of the following year.

Between Forest Park, Ill., and Elmhurst the maximum grade was reduced to .5 per cent., since this is a switching district of dense traffic, and it was considered desirable to have the grades as light as practicable. Double track was built from Stockton to Kent, 5½ miles; from Forest Park to Elmhurst, 6.8 miles, and from Stanley, Iowa, to Aurora, 4.1 miles. Passing tracks were extended to 3,000 ft. in the clear at Ingalton, Lily Lake, Richardson, Wilkinson, Byron, South Freeport, Elizabeth, Farley, Dyersville, Almoral, Durango, Thorpe and Aurora. Additional yard tracks were built at Forest Park, Maywood and Bellewood. A new spur into the industrial section on the west side of the Fox river was built at West St. Charles, Ill. The entire division was laid with 85-lb. rails with Weber joints, creosoted ties and gravel ballast.

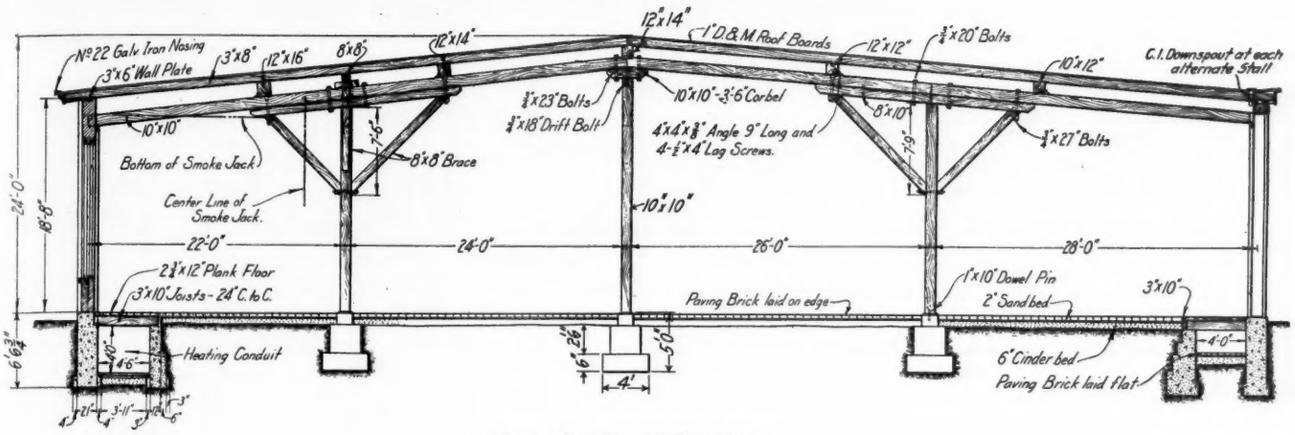
The building of the Maywood yard and of the passing track at Lily Lake was handled by company forces, using flat cars and a Lidgerwood unloader for the former, and side dump cars for the latter. The grading at Elmhurst was done by a contractor using a narrow gage contractors' outfit. The grading for the Stockton terminal, the building of the double track between Stanley and Aurora, and all the bridge and culvert work involved were contracted.



Layout of Terminal at Stockton, Ill.

Quicksand was encountered under peculiar circumstances at Elmhurst and Stockton, in both instances the deposit being in high ground. While the steam shovel was working in a cut at Elmhurst, its supports suddenly went down, slewing the shovel across the running track. It was necessary to crib up under the shovel with ties before work could be continued. When this cut was finished to permanent subgrade there were no evidences of quicksand, but great care was taken in draining it to eliminate any possibility of future trouble. In the Stockton yard work the main track was being lowered under traffic when a deposit of quicksand was encountered, and in order to prevent the filling under the track from flowing out sheeting was driven on either side and allowed to remain in place until the track could be lowered to a firm subgrade. In this case also, the final subgrade was well below the quicksand deposit and no further trouble is expected.

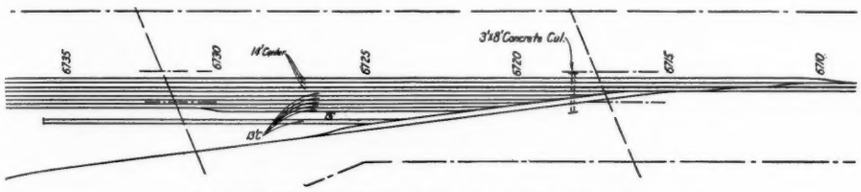
The culverts included in the sections on which a second track was added were extended by adding concrete or cast iron pipes. In some instances the old culverts were rail top stone boxes, and in these cases concrete pipe for the addition was tied to



Cross Section of Roundhouse.

the stone by dowel pins set at a sharp angle on vertical faces and vertically on horizontal surfaces.

The Stockton terminal includes a 6-track storage classification yard and two passing tracks, a 12-stall engine house, 90-ft. turntable, 100-ton concrete Link Belt coal chute, oil house, cinder pit, sand house, water tank, employees' rest house and office building. The yard is laid with 75-lb. rail and No. 8 frogs are used. About 117,000 yds. of material were used in grading the yard. Future growth has been carefully considered in designing this terminal, and the arrangement is such that additional facilities can be provided at the least expense and with the least interruption to traffic.



Layout of Terminal at Stockton, Ill. (Continued).

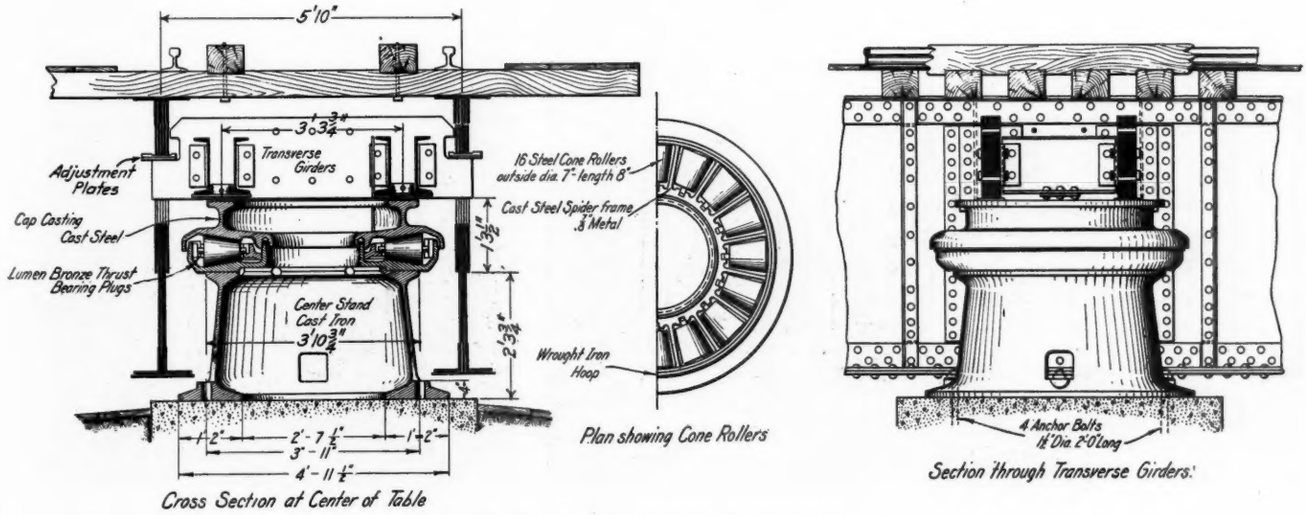
The engine house, which contains 12 stalls, is of brick construction on a concrete foundation. Details of the framing and roof construction are shown in the cross section reproduced herewith. It is equipped with a heating plant, machine shop, automatic washout and refilling system, and a power plant supplying electric current for light and power.

The turntable is of the standard design furnished by the Strobel Steel Construction Company, is set in a concrete pit and is operated by an electric tractor designed by Geo. P. Nichols & Bro. A detail of the 16-cone center for this table is shown in the drawings. The feature of special interest in this type of center is the provision which is made for adjusting the elevation of the table by inserting adjusting plates under the four points of support of the cross girders. The trailing girders at each end of the table carry four high carbon cast steel wheels running on bronze bushings.

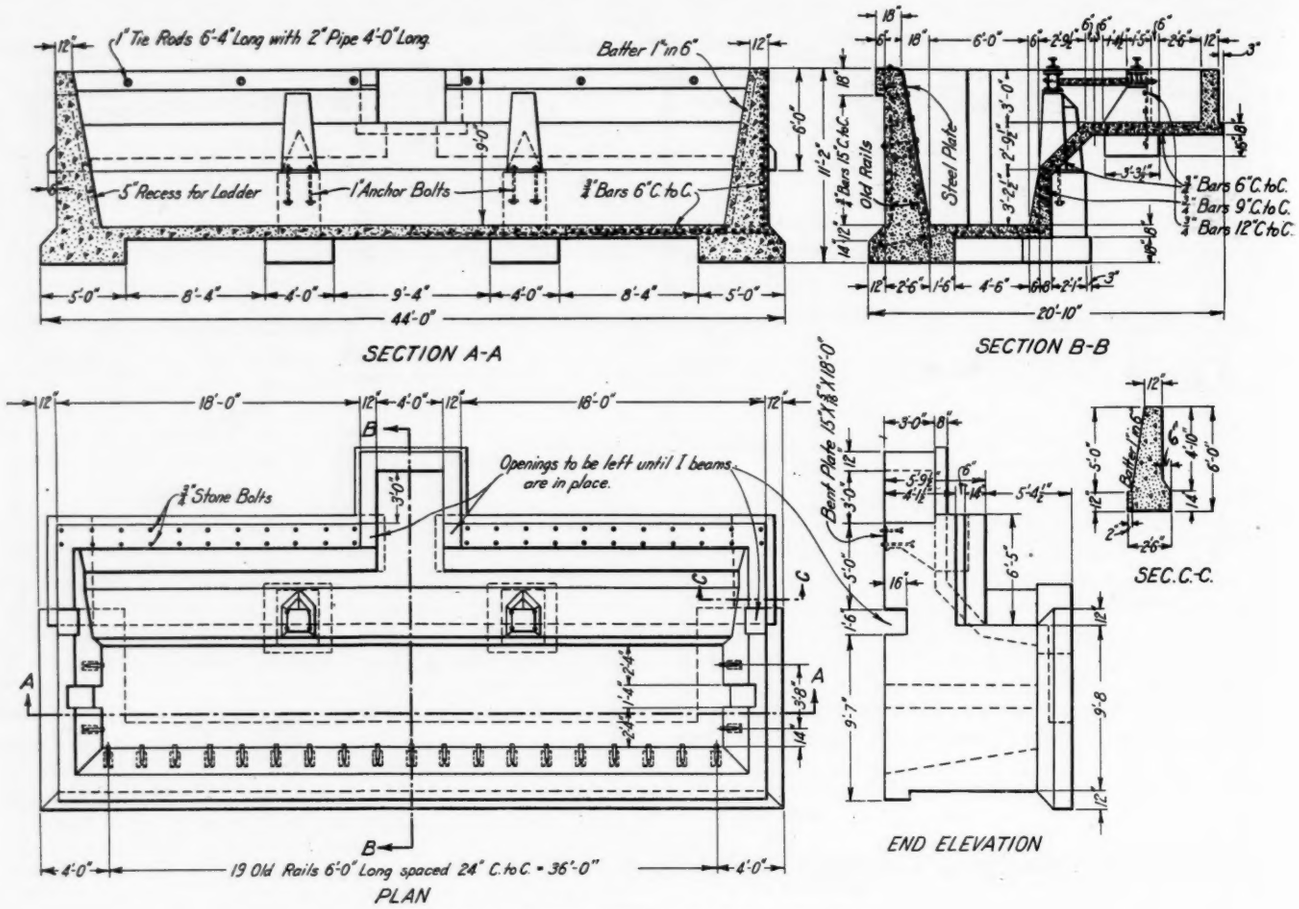
The oil house is of reinforced concrete and is fireproof throughout. A Bowser pumping outfit is installed for handling all oils. The coaling station is of the Link-Belt design and is also of reinforced concrete. It is provided with automatic scales and hoisting machinery of improved design, so that coal and sand can be delivered to locomotives at one spotting. The sand house is of brick construction and the sand is conveyed to the top of the coal chute by a compresed air system.

The cinder pit is of reinforced concrete construction and is operated with a clamshell. Details of its construction are shown. The water tank has a capacity of 100,000 gals., is supported on a 50-ft. steel frame, and is of the hemispherical bottom steel plate design. The tank is fed by gravity from a pumping plant at Stockton station, two miles away. The tank furnishes water for engine supply and fire protection.

The employees' rest house is a two-story frame building containing 28 rooms with a large dining-room and kitchen. It is provided with hot water, heat and electric lights, and affords



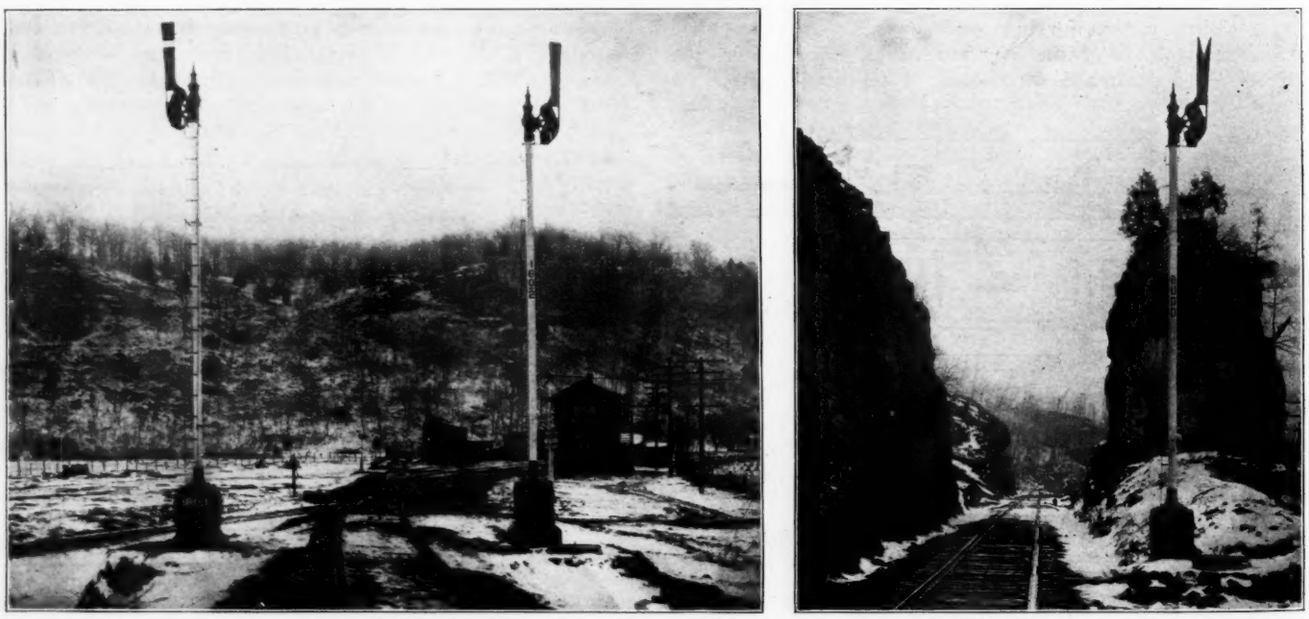
Strobel 90-Ft. Turntable at Stockton.


1" Tie Rods 6'-4" Long with 2" Pipe 4'-0" Long
Batter 1" in 6"
5" Recess for Ladder
1" Anchor Bolts
Bars 6" C. to C.
SECTION A-A
Old Rails
Steel Plate
Bars 6" C. to C.
Bars 9" C. to C.
Bars 12" C. to C.
SECTION B-B
Openings to be left until I beams are in place.
Stone Bolts
Bent Plate 15"x3/8"x18'-0"
SEC. C.-C.
END ELEVATION
19 Old Rails 6'-0" Long spaced 24" C. to C. = 36'-0"
PLAN

Reinforced Concrete Cinder Pit at Stockton.

first-class living accommodations for the employees who are required to lay over in Stockton. The office building is two stories high, of frame construction, and accommodates the despatcher and the yardmaster.

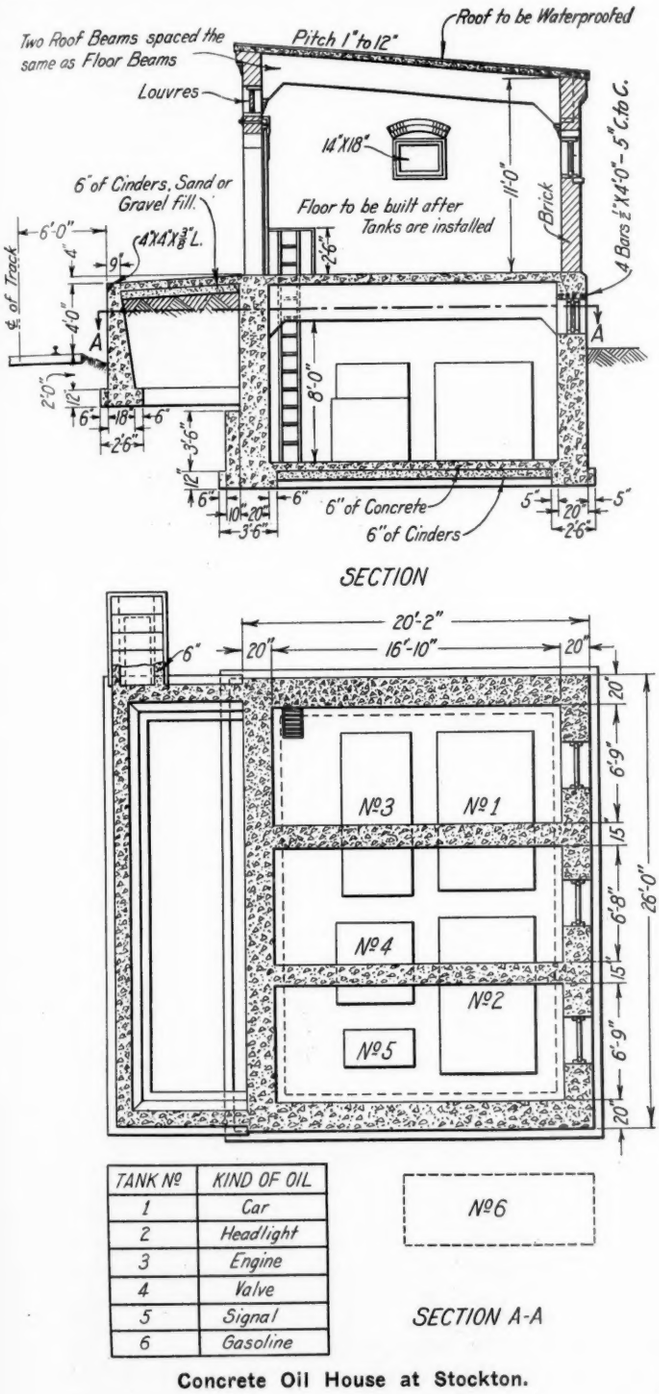
A complete installation of automatic block signals has been made between Chicago and Oelwein. General Electric, type M 116, d. c., bottom-post, electric motor signals are used throughout and indications are given in the upper right-hand quadrant using the normal-clear system. Each signal is operated by 16 R. S. A. standard primary cells of caustic soda battery, connected in series, and the track circuits are fed from three gravity cells in multiple. The primary batteries are housed in Massey type B battery wells, and the track batteries in concrete battery chutes. The concrete signal foundations are of the sec-



Upper Quadrant Signals on Chicago Great Western.

tional type and were made and delivered in three pieces, the lower and middle sections being placed in position by the steam derrick at the same time the battery wells were placed. The use of this type of foundation avoided the necessity of distributing and protecting the loose concrete materials and eliminated the trouble and loss of time involved in securing a water supply for concrete.

On single track two signals are located near the ends of passing tracks with one or more sets of intermediate signals between



TANK №	KIND OF OIL
1	Car
2	Headlight
3	Engine
4	Valve
5	Signal
6	Gasoline

Concrete Oil House at Stockton.

stations, depending on the distance between tracks and the conditions affecting each particular location. Caution signals are provided 3,000 ft. from the end of passing tracks, except where local conditions make it impossible to use this distance. All signals on single track operate in two positions, except where the block signal is used to regulate the approach to an interlocking plant, where the third or 45-deg. position is used to indicate caution in case the interlocked home signal is at stop. Switch indicators are provided where it was found impracticable to locate signals in the vicinity of main-track switches, as at cross-overs between the main track and the passing track, when such cross-overs are located between the ends of long passing tracks or in yards. On double tracks, indicators are provided for all non-interlocked switches and the control circuits are arranged to overlap the second signal in advance of the switch. Three-position signals, placed approximately 1½ miles apart, are used on all double track. Important main track cross-overs in double-track territory are provided with electric locks to prevent the operation of the switches after a train on the main track has entered the block. A release circuit is provided so that no inconvenience is occasioned in the making of switching movements.

The Chicago Great Western has adopted the practice in this installation of stenciling the station name on the distant signal and the number of miles from Chicago on the home signal, as shown in the photograph. By this means the distant signals replace the mile board formerly used. The numbers on the home signals give the distance in miles and tenths, the odd numbers in tenths being shown on westbound signals and the even numbers on eastbound signals, thus conforming to train numbers. The figures and letters are 6 in. high, 4 in. wide and 1 in. in width of outline.

The signal installation was made by the railway company's signal department, work being commenced in April, 1910, and completed in March, 1911. Between April 1 and April 12 272,544 signal movements were made without a failure of any kind.

The entire work of improving the Chicago-Oelwein division was done under the supervision of L. C. Fritch, chief engineer, the signal work being under the direct charge of J. Beaumont, signal engineer, to both of whom we are indebted for the foregoing information.

ACCIDENT BULLETIN NO. 38.

The Interstate Commerce Commission has issued Accident Bulletin No. 38, containing the record of railway accidents in the United States during the three months ending December 31, 1910. The number of persons killed in train accidents was 248, and of injured 3,729. Accidents of other kinds, including those sustained by employees while at work, by passengers in getting on or off cars, by travelers at highway crossings, by persons doing business at stations, etc., by trespassers, and others, bring up the total number of casualties, excluding "industrial accidents," to 22,586 (2,659 killed and 19,927 injured). The casualties are classified in Table 1, given herewith, which includes some details from Table 1B not here shown.[1] (The accident statistics of electric lines are given in a separate table.) Supplementing the statement of railway accidents proper the commission gives the following record of "Industrial accidents"; those occurring to employees of the railway on railway premises in which the movement of cars or engines is not involved:

Industrial accidents to employees.

	Killed.	Inj'd.
While working on tracks or bridges	36	4,239
At stations, freight houses, engine houses, coaling stations, water stations, etc., where no moving railroad car or engine is involved	26	4,847
In and around shops	21	9,426
On boats and wharves	3	325
At other places	21	1,557
Total	107	20,394

Adding the casualties to employees in industrial accidents to

[1] This bulletin is the second to be issued under the revised accident law. The class termed "Industrial accidents" includes a large part of those casualties to employees which in former bulletins have been included in Table No. 1, under "Other causes."

the figures given in the larger table we find that the total number of employees killed, including those who were not on duty, is 1,042, and the total number injured 24,276; and this makes the total number of persons killed, all classes, 2,766, and injured 40,321.

In those classes of items in Table No. 1 which are made up on the same basis as under the former law, and which therefore may be compared with the records of a year ago, the totals show decreases in every instance, as will be seen by Table 1A below; and the comparison with Bulletin 37, for the quarter immediately preceding this, is favorable also, except under the head of coupling accidents. In connection with the first item of Table No. 1A it is to be observed that in this quarter, as in the one last preceding, the figures here shown should be supplemented by those showing passengers killed in collisions on electric railways for in both these quarters the worst disasters in the record occurred on "interurban" lines. These electric-car collisions are included in Table No. 2A.

In the larger double column table will be found the usual list of class A train accidents—all in which the damage is reported at $10,000 or over, notable cases in which passengers are killed, and those doing damage less than $10,000 and down to $2,000, wherever the circumstances or the cause may be of particular interest.

Collision No. 7 was a butting collision of passenger trains on a double-track railway; the westbound train having been turned on to the eastbound track for a few miles in consequence of an obstruction on the westbound track. When it had nearly reached the point where it would be returned to the westbound track and while running at about 25 miles an hour, it was met by an eastbound train running at about 45 miles an hour. The collision occurred at about 2 a. m. The eastbound train had run past one distant and three home signals set against it. The engineman was killed and it is not known how he came to disregard the signals; but the superintendent reaches the conclusion that probably he had been disabled by sudden sickness or by sudden death. He was 55 years old and had been a careful and painstaking engineman for 26 years. About 10 months before the date of the accident he had taken a vacation of considerable length because of ill-health, and at the investigation of the accident it was disclosed that he had recently been taken sick on the street. At one time he had been unconscious for about 40 minutes in a fainting spell, with apparently complete suspension of animation; but there were no indications of sickness when he reported for duty on the trip which ended in the collision.

Collision No. 12 between westbound and eastbound freight trains, about 3 a. m., was due to the failure of the men on the westbound train to identify eastbound trains which they met. The engineman of the westbound train was killed and his neglect is unexplained. This train was ordered to meet two eastbound trains at G, and the conductor and the other surviving members of the crew say that they thought they saw the tail lights of two trains at that station; but they admit they did not take care to see whether there were two engines. The eastbound train which was met at G sounded a whistle signal to indicate that a second section of the same train was following, and this whistle signal was answered by a whistle signal from the engine of the westbound train; but it is the conclusion of the superintendent that this answer was given by the fireman and that the engineman was asleep.

Collision No. 13 occurred on an electric interurban railway. It was between a northbound and a southbound passenger train, each "train" consisting of a single car. Both were running at a speed of about 35 miles an hour immediately before the

TABLE NO. 1.—CASUALTIES TO PASSENGERS, EMPLOYEES, AND OTHER PERSONS.

	Passengers.		Employees on duty.		Employees not on duty.		Other persons not trespassing.		Trespassers.		Total persons.	
	Killed.	Inj'd.	Killed.	Inj'd.	Killed.	Inj'd.	Killed.	Inj'd.	Killed.	Inj'd.	Killed.	Inj'd.
Collisions	18	974	115	1,093	2	27	2	16	7	9	114	2,119
Derailments	12	588	56	422	...	15	...	14	7	17	75	1,056
Accidents to trains, cars, or engines, except collisions, derailments, and boiler explosions	...	39	2	205	...	...	1	14	...	...	3	258
Bursting of, or defects in, locomotive boilers or boiler attachments	...	...	26	292	...	...	...	...	...	4	26	296
Total train accidents	30	1,601	199	2,012	2	42	3	44	14	30	248	3,729
Accidents to roadway or bridges not causing derailment, such as fires, floods, landslides, explosions, etc	1	6	...	27	...	...	...	1	...	...	1	34
Coupling or uncoupling cars	...	...	60	877	...	...	...	...	...	...	60	877
While doing other work about trains (not in shops or engine houses) or while attending switches	...	...	39	5,356	...	1	...	1	...	...	39	5,358
Coming in contact while riding on cars, with overhead bridges, tunnels, or any signal apparatus, or any fixed structure above or at the side of the track	...	6	23	429	1	3	...	...	4	11	28	449
Falling from cars or engines	21	96	108	1,669	1	13	4	15	99	109	233	1,902
Getting on or off cars or engines	24	697	50	2,257	8	68	6	45	111	319	199	3,386
Other accidents on or around trains not here named	6	807	1	175	1	21	...	112	10	41	18	1,156
Being struck or run over by engine or car at stations or yards	13	41	209	400	32	19	38	122	266	248	558	830
Being struck or run over by engine or car at highway grade crossings	...	1	10	15	3	2	233	663	35	32	281	713
Being struck or run over by engine or car at other places	...	...	128	157	41	15	18	53	746	345	933	570
Other causes	1	91	14	262	5	62	12	423	29	85	61	923
Total, other than train accidents	66	1,745	642	11,624	92	204	311	1,435	1,300	1,190	2,411	16,198
Grand total	96	3,346	841	13,636	94	246	314	1,479	1,314	1,220	2,659	19,927

TABLE NO. 1A.—*Comparison of principal items with last bulletin and with one year back.*

	Bulletin 38.	Bulletin 37.	Bulletin 34.
1. Passengers killed in train accidents	30	63	39
2. Passengers killed, all causes	96	135	105
3. Employees (on duty) killed in train accidents	199	209	205
4. Employees (on duty) killed in coupling	60	56	66
5. Employees (on duty) killed, total	841	869	968
6. Total, passengers and employees (items 2 and 5, above)	937	1,004	1,073
7. Other persons killed (including trespassers, non-trespassers, and employees not on duty), all causes	1,722	1,944	...
8. Employees killed in industrial accidents	107	132	...

The total number of collisions and derailments in the quarter now under review was 3,366, of which 241 collisions and 152 derailments affected passenger trains. The damage to cars, engines, and roadway by these accidents mounted to $2,831,469, as below:

TABLE NO. 2.—*Collisions and derailments.*

	Number.	Loss.	Killed.	Inj'd.
Collisions, rear	405	$427,895	47	482
Collisions, butting	212	462,246	58	663
Collisions, train separating	102	37,832	..	37
Collisions, miscellaneous	1,115	570,313	39	937
Total	1,834	$1,498,286	144	2,119
Derailments due to defects of roadway, etc.	297	$263,186	9	382
Derailments due to defect of equipment	709	599,532	10	146
Derailments due to negligence	108	77,957	10	89
Derailments due to unforeseen obstruction	58	38,176	6	71
Derailments due to malicious obstruction	15	24,376	7	32
Derailments due to miscellaneous causes	345	329,956	33	336
Total	1,532	$1,333,183	75	1,056
Total collisions and derailments	3,366	$2,831,469	219	3,175
Total for same quarter of 1909	3,206	2,733,830	220	3,731
1908	2,684	1,940,133	173	2,616
1907	3,964	2,962,470	197	3,813

collision, and both were badly wrecked. The collision was due to forgetfulness of the men in charge of the northbound train. They ran their car about 2½ miles beyond the point at which they should have met the southbound, this point having been fixed by an order that had been issued to them by the train despatcher.

The motorman at fault has absolutely no explanation to give as to how he came to forget the order. He had been on duty only 18 minutes, having just begun his trip. He had been in the employ of the road about four years, and is spoken of in the report as a careful and competent employee.

The conductor of this car claims to have observed that the motorman was running past the appointed meeting place, and says that he gave a signal of one stroke on the bell, indicating "stop"; but the motorman denies that he received such a signal, claiming that he received a signal of two strokes, meaning "proceed." The superintendent holds that the conductor, instead of giving the ordinary stop signal, should have given the emergency stop signal provided for in the rules. This was not done. The conductor says that when he noticed that the motorman did not obey the stop signal he assumed that he (the motorman) had received further orders; and the conductor started toward

TABLE NO. 2A.—CAUSES OF 47 PROMINENT TRAIN ACCIDENTS.

[NOTE.—R stands for rear collision; B, butting collision; M, miscellaneous collisions; D, derailment; P, passenger train; F, freight and miscellaneous trains.]

COLLISIONS.

No.	Class.	Kind of train.	Killed.	Injured.	Damage to engines, cars and roadway.	Reference to record.	Cause.
1	R	P. and P.	1	154	$359	71	Electric car run into by following car by reason of darkness. Leading car had been stopped by some defect and the trolley wheel had been pulled away from the trolley wire, extinguishing tail lights.
2	R	P. and P.	1	24	2,008	72	Despatcher, contrary to rule, authorized the running of the second section of a passenger train on a caution card. Engineman also at fault for not keeping a good lookout; he was flagged but did not heed the signal.
3	M	F. and F.	2	2	2,400	46	Collision at meeting point (5 a. m.). Engineman and fireman of westbound train, asleep, had run past two automatic block signals and a fusee. Men in charge of eastbound train at fault for encroaching on the time of the westbound, 3 minutes.
4	R	P. and P.	5	4	2,812	15	Passenger train approached station not under control (6 a. m.). Five drovers in freight caboose killed. Engineman addicted to liquor, but his superiors had not discovered the fact.
5	B	F. and F.	0	6	2,961	42	Collision at meeting point (4 a. m.). Engineman asleep; had been on duty 4 hours.
6	B	F. and F.	5	25	2,973	1	Work train and extra freight train collided in dense fog. Men in charge of freight at fault for not protecting their train by sending out flagman.
7	B	P. and P.	6	18	35,500	81	Disregard of block signals. Engineman reported killed; but it is believed that he had been disabled by sudden sickness or death. See note in text.
8	R	P. and F.	3	0	4,874	77	Passenger train (3 a. m.) ran into rear of extra freight. Clear block signal given when block was not clear, by telegrapher 21 years old, of 2 years' experience.
9	B	F. and F.	3	1	5,000	6	Operator failed to deliver order.
10	B	P. and F.	0	9	5,200	70	Engineman of light engine overlooked schedule of regular passenger train. No conductor on light engine; engineman experienced; fireman, 21 years old, was on his first trip outside of yard; had been in service in yard 17 days.
11	B	F. and F.	1	4	5,660	3	Operator failed to deliver order; conductor and engineman neglected to check clearance card against orders in their possession.
12	B	F. and F.	4	4	6,200	89	Failure to identify train met. See note in text.
13	B	P. and P.	36	19	7,500	9	Northbound electric car ran past meeting point. See note in text.
14	R	F. and P.	2	21	8,600	13	False clear block signal. See note in text.
15	B	F. and F.	3	2	8,700	82	Westbound extra encroached on time of regular eastbound freight; engineman killed; extra had right over second section, but conductor carelessly assumed had right over both first and second. He did not show order to flagman.
16	B	F. and F.	1	1	9,000	11	Engineman of light engine misread despatcher's order; fireman did not read it.
17	M	P. and F.	1	3	10,000	49	Excessive speed and disregard of stop signal at interlocking. Engineman killed.
18	B	P. and F.	2	13	10,000	52	False clear block signal. See note in text.
19	B	P. and P.	0	29	10,150	14	Misplaced switch in yard; low switch stand; engineman and fireman not blamed.
20	B	F. and F.	1	6	10,475	47	Westbound train ordered to run 2 hours 25 minutes late; ran 2 hours 15 minutes late (3 a. m.). Engineman says he made mistake reading time-table; conductor makes same claim, but superintendent does not admit claim.
21	B	P. and F.	3	7	10,874	54	Careless running. See note in text.
22	R	P. and F.	0	8	14,600	73	Passenger train standing at flag station run into at rear by following freight; operator 6 miles back did not maintain full time interval between trains. Men in charge of both trains also at fault.
23	M	P. and P.	0	28	14,700	39	False clear block signal. See note in text.
24	M	P. and F.	1	18	16,700	87	Passenger train approached station with speed not under proper control; yard engine on main track without protection. Engineman of passenger train killed.
25	B	P. and P.	6	29	18,300	7	Operator failed to deliver order. See note in text.
26	B	F. and F.	8	1	27,600	53	Conductor and engineman of westbound train overlooked schedule of eastbound (4 a. m.). These 2 men were killed.
27	B	F. and F.	3	11	50,000	83	Train of 13 dump cars became uncontrollable on steep descending grade. It is believed that an angle cock accidentally became closed.
28	R	P. and F.	1	10	15,000	90	Careless running, and failure of flagman to protect standing car. (Electric cars.)
	Total	.....	99	457	$318,146	...	

DERAILMENTS.

1	D	P.	1	1	$1,000	38	Improper fitting of miter rail joint at drawbridge. See note in text.
2	D	P.	3	58	2,500	31	Excessive speed; 60 miles an hour on track where the highest allowable speed was 30 miles an hour; conductor and engineman both experienced.
3	D	F.	3	0	4,919	103	Excessive speed on curve; engineman was making his fourth trip on this division.
4	D	P.	0	2	7,200	36	False clear signal. See note in text.
5	D	P.	0	19	8,600	94	Defective side bearing of tender.
6	D	F.	0	0	10,000	18	Broken flange.
7	D	F.	0	0	10,259	61	Broken axle.
8	D	P.	0	1	10,700	60	Excessive speed through crossover. Engineman (3 a. m.) failed to observe distant signal.
9	D	F.	0	0	10,860	59	Runaway on steep descending grade. See note in text.
10	D	F.	0	0	11,100	21	Runaway on steep descending grade. In preparing to move standing cars, the hand brakes were released before the air reservoir was filled.
11	D	P.	1	45	11,259	98	Derailed at frog because of absence of guard rail. Guard rail had been torn up by some cause undiscovered.
12	D	F.	0	0	12,000	91	Part of brake rigging fell on track.
13	D	F.	0	0	12,819	95	Broken arch bar in truck of coal car.
14	D	P.	1	14	14,000	35	Misplaced switch (4 a. m.). Switch had been run through by a freight train traveling in the opposite direction.
15	D	F.	0	3	15,000	27	At derailing switch at end of double track; excessive speed on descending grade.
16	D	F.	0	0	15,859	25	Broken truck (arch bar).
17	D	P.	4	18	19,235	101	Undiscovered; speed 40 miles an hour; curvature of track 6 degrees; track in good condition. Four mail clerks killed.
18	D	F.	2	2	20,200	26	Undiscovered.
19	D	P.	0	55	36,000	23	Failure of top chord of lattice girder bridge, 76 feet long. Plan of bridge provided a sufficient factor of safety; "failure of material a mystery."
	Total	.....	15	218	$233,510	...	
	Total collisions and derailments	....	114	675	$551,656	...	

the front of the car to inquire as to this. He was stopped, however, by a passenger who asked him a question, and before he had finished talking with the passenger the collision had occurred. The conductor had been employed by the company about three months, and his record up to the time of the collision was clear. He had previously and for several years been employed as night agent at a station on a large railway and brought recommendations from that road as a capable man, sober, industrious, and honest; and as one whose work had been satisfactory.

Collision No. 14 was due, primarily, to a false clear block signal. A passenger train, standing at a station, was run into at the rear by two engines, coupled together, without train, and the rear car of the passenger train was wrecked, and was destroyed by fire, illuminating gas from its ruptured pipes having been ignited by sparks in the front end of the colliding engine, which was broken. The station at which the passenger train was standing was at about the middle of the block section. The block section (manual) extends from C, 2 miles west of this station, to S, 2 miles east of it. The passenger train had been delayed eight minutes by a defective coupler, and the rear brakeman is held at fault for not having gone back with red signals to stop any following train. The conductor is also held at fault for not having seen that this was done. The rear passenger car of the train was empty at the moment of the collision, and the two persons killed and three of the injured were standing at the moment of the collision, on the track between the engine of the passenger train and its leading car, the defective coupler having been at this point. The signalman at C had had four and one-half months' experience, but had been a telegrapher for three years before that.

Collision No. 18 was due to a false clear block signal given by a signalman who was confused. He omitted to examine the block sheet, and also gave misleading information to the despatcher. He gave a clear block signal and also a clearance card to a westbound work train. This train was delayed and did not start at the time expected, and the signalman, being called upon to admit another train to the block section, canceled (on his record) the right of the work train to the block, without communicating with the work-train conductor, and then he authorized the station at the other end of the block to give a clear signal to an eastbound train. This signalman had been in the service three months.

Collision No. 21, which occurred at midnight on a cold and stormy night, was due to a lack of caution on the part of the engineman of a passenger train. This engineman was killed. A helping engine, attached to the front of the train, had just been detached and run forward about 1,500 ft. to be backed into a sidetrack, so as to allow the passenger train to proceed on its way. On account of the switch of the sidetrack being frozen, the helping engine was run forward some distance to another sidetrack, and just as it was backing into this track it was struck by a passenger train. The engineman of the helping engine says that he sounded two blasts of the whistle to indicate to the engineman of the passenger train what was being done. It is supposed that the engineman of the passenger train misinterpreted this whistle signal, assumed that it meant that the helping engine was clear of the main track, and did not notice that it had gone forward to the second switch. It appears that he ran his engine into the helping engine without seeing it. An eastbound train, passing at the time, was damaged by the engines which were derailed in the collision.

Collision No. 23, which occurred about 2 a. m., was between eastbound and westbound passenger trains, and was due principally to the error of a telegrapher in giving a clear block signal wrongfully. The westbound train was entering the sidetrack at a point about 750 ft. east of the station, and it was struck in the side by the eastbound, which had been started from the station in consequence of the clear track signal erroneously given. It was the duty of the telegrapher in the station to know positively from his own observation that the westbound train was in the sidetrack, clear of the main line, before giving the clear signal to the eastbound train. The engineman and fireman of the eastbound knew that they were to meet the westbound at this station, and are also held blameworthy for proceeding without knowing that the main track was clear. The engineman said that he was deceived by an "all right" hand signal given by some person standing on the main track in the vicinity of the westbound train. The superintendent finds that no such hand signal was given, but thinks it possible that the engineman saw a signal which was given by a brakeman of the westbound train to the engineman of his own train.

Collision No. 25 was due to failure on the part of a telegraph operator to deliver an order to an eastbound train. This order, sent to the operator at M and requiring the eastbound train to wait at M for the westbound train, was sent in the regular form and after the operator, in accordance with the rule, had advised the despatcher that the stop signal had been displayed to stop the train. But the signal was not displayed, and the train passed the station and collided with the opposing train after running a very short distance. As these two trains had frequently been ordered to meet at this place, the conductor of the eastbound train went to the office and asked the operator if there were any orders for that train, and was told "no." Not satisfied with this, he went to the operator a second time, repeated his question, and received the same reply. The facts of the case as here stated are denied by the operator, and he stated that "he had not been drinking." This operator is 30 years old. He has been in the employ of the road about 18 months, and had had 7 years' experience in railroad work before that.

Derailment No. 1 occurred at a drawbridge at 6:30 p. m. The engine and tender fell into the river and the engineman was drowned. The train had been brought to a stop just before proceeding to cross the drawbridge and had received the proper hand signal from the bridge tender; but one of the movable rails at the end of the bridge, which had been lifted the last time the bridge had opened, had not dropped in place; it had rested on the top of the fixed rail, and this maladjustment was the cause of the wreck. The bridge tender had not discovered the trouble and gave the proceed signal as though the track were in good condition. The report does not say how it came about that the rail failed to drop in place, the cause not having been determined. It may have been from unusual expansion. The rail was not interlocked in any way. The bridge tender in charge was 22 years old and had been in the service seven weeks.

Derailment No. 4 occurred about 5 a. m. to train No. 49. It was due to the negligence of a signalman in charge of switches at a junction and to the improper clearing of a signal which was out of order. The engine ran about 300 feet when off the rails and was overturned, and five baggage cars were damaged. It appears that, after a previous train had used the crossover track, the signalman forgot to close the derailing switch, and the signal which should have stopped train No. 49 before it reached this switch had been fastened in the clear position because of some of the connections being out of order. The superintendent holds blameworthy the signal maintainer for thus fastening the signal, contrary to the regulations, and also the second-track and third-trick signalmen for consenting to work under this irregular condition. All of these men had been in the service several years.

Derailment No. 9, occurring about 5 a. m., was due to the accidental closing of the angle cock in the air-brake pipe on the fifth car back of the engine of a freight train of 42 cars. In consequence of the inability of the engineman to control the speed of the train it ran at uncontrolled speed for about 8 miles, when, at a curve, 36 cars were derailed; the engine and first 6 cars, however, ran safely some distance farther, to a point where they were stopped by an adverse grade. As the train started from the summit, at A, the only men in position to control it were the engineman, the fireman, and one trainman,

as the conductor and the rear trainman were on the caboose, which had been detached with a pushing engine which had assisted the train to this point. When the engineman tested the air brakes, immediately after passing the summit, he noticed by the exhaust that the train line probably was obstructed, and he sent the trainman back to look for the trouble. The engineman lighted a torch and immediately followed, but had gone only as far as the third car when his torch was extinguished by the wind. By this time the speed of the train had so increased that all three of these men became alarmed and jumped off. In the examination of the engine and the six cars which were not derailed it was found that a draft timber at the rear end of the fifth car had become loosened and had dropped so far that it rested on an angle cock in such a way as to turn it, and it is the conclusion that this was the primary cause of the wreck. It is not known where the damage to the draft timber occurred, but it is believed to have occurred at a point 9 miles back, where a stop was made to take water. The air brakes had worked properly as far as this watering station, and on the five cars which were not derailed the brake shoes were found to have been badly heated. As the grade where this accident occurred was descending at the rate of 1.3 per cent., it is the conclusion of the superintendent that it would have been impossible to hold the train by the few air brakes available; that after the train had gained the headway that it did while the engineman was looking for the trouble, it would have been impossible for the three men to have checked the speed by the use of hand brakes, and therefore the engineman did not desert the train until after it was impossible to control it. The detaching of the caboose at the head of the grade was necessary because the helping engine was ahead of it. The company has now ordered this practice discontinued, and helping engines are to be attached behind the caboose.

Electric railways reporting to the Commission had 114 persons killed during the quarter and 1,031 injured; and there were 46 collisions and 21 derailments. Thirty-four passengers and six employees were killed in collisions; and one employee was killed by a derailment. The total number of pasengers killed was 42; employees killed 20, including one not on duty and four in "industrial" accidents; trespassers struck or run over by cars 37. Of this 37 the number killed was 25 and the number injured was 12.

THE TRANS-PARAGUAYAN RAILWAY.

The extension of the Trans-Paraguayan Railway marks one of the most important undertakings in the development of the republic. At present the main line of this road has been constructed from Santos, Brazil, to a point near the celebrated Iguazu falls on the Iguazu river, but the proposed extension will lead it through the great quebracho, or ironwood, districts of Paraguay, Argentina, and Bolivia. It will also place these countries in direct railway communication with Brazil and Chile. Not only will the great tracts of quebracho and other timber lands be benefited, but extensive zones of rich agricultural and grazing lands will be thrown open to settlement and cultivation. The proposed extension will also cross a number of important navigable rivers which, with their numerous tributaries, penetrate vast areas of only partially explored or wholly unexplored countries. The railway will also tap the productive yerba maté region of the upper Parana river, and, traversing the republic of Paraguay, will arrive at Villa Hayes, a bustling port on the Paraguay river. From this point the extended railway will enter the partially explored Chaco territory noted the world over for its abounding forests of ironwood. The completion of the proposed extension will place Paraguay and Brazil into rail communication with the port of Antofagasta, Chile, and with the great railway system of Bolivia and southern Peru, thereby filling a long left want of these five South American countries.

GRAND CENTRAL INTERLOCKING MACHINE.

H. S. Balliet, engineer of maintenance of way of the Grand Central Terminal, New York City (and also signal engineer of the electric division), has just set up a 400-lever electric interlocking machine in one of the two principal cabins of the Grand Central Terminal; and a picture of the machine, as it was set up for testing in the shop of the General Railway Signal Company at Rochester, is given herewith. Back of this machine is seen the 360-lever machine which is to be set up in the cabin for the upper level; the first mentioned being for the lower level. These machines have "lever lights" or illuminated numbers over each lever, and the numbers on some of these are faintly discernible in the foreground of the picture. The irregularity of appearance of the controllers, which appear at the back part of the machine, is due to the fact that on some of the levers these controllers are two tiers in height, on others three, and on others four or five. The construction of these "unit levers" was described and illustrated in the *Railway Age Gazette* of October 7 last, page 624. In that issue was also shown the design of the "four-story" fireproof signal cabin. In this building the rooms used for the interlocking machines are in the second and fourth stories (at the north end) that in the second story for the lower level tracks, and that in the fourth for the upper level tracks. This building, just north of 49th street, stands close to the line of Park avenue, which is over head, and which runs parallel to the center tracks through the yard. The signal station for the upper level is designated "A," and that for the lower level "B."

The interlocking machines are the General Railway Signal Company's model No. 2, but the lever arrangement as well as numerous details was designed by Mr. Balliet and his assistants.

The 400-lever machine is 67 ft. 7 in. long, 2 ft. 6⅛ in. wide and 4 ft. 3⅝ in. high. It is built in ten sections, each section comprising fifteen locking plates, or a total of one hundred and fifty plates. In order to have perfect alinement of tappets and locking, these plates, which are 16 in. long, have been milled to within 1-1,000th of an inch of the calculated size. The length of the longest locking strip used in this machine is 210 in.

There are five distinct operating sections to this interlocking machine. That is to say, it is an assemblage of five interlocking machines in one room, and interconnected by means of mechanical interlocking, instead of electrically, as would become necessary if there were five separate plants.

The following tabulation shows the number of units controlled from each section:

	Section Nos.					
	1	2	3	4	5	Ttl.
Levers for signals	21	43	34	51	60	209
Levers for switches and M. P. frogs	10	33	26	45	39	153
Total working levers	31	76	60	96	99	362
Spare spaces	5	8	7	11	7	38
Total frame	36	84	67	107	106	400

There is a lever for each signal, that is to say, no signals are worked through selectors. There is also a lever controlling each point switch, each set of slip points and each set of movable point frogs, the entire arrangement having been worked out on the basis of the simplest method of maintaining the apparatus and of promptly making repairs if failures occur. The 153 switch levers control switches as follows: 13 turnouts No. 6½, 16 turnouts No. 7, 35, No. 8, 1 No. 10, and 1 No. 12; 6 No. 7 double slips, 23 No. 8 double slips, and 29 movable point frogs, 6 of them No. 7 and 23 No. 8. The use of sub-stations at 10 points in the yards was described in our former article, referred to above.

The levers in this machine are numbered from 701 to 1,100 inclusive. Throughout the yard each switch, slip, movable point frog and signal has a different number, so that there are no duplicates anywhere in the whole terminal, including both the upper and lower levels. This plan was adopted to simplify the issuing of orders and the interchange of directors and other employees between the different cabins. Thus any function in

either yard can be quickly and accurately designated with the least possible chance of error.

With the two machines in stations A and B this building will house the largest number of interlocking levers ever assembled under one roof. As the cabins, both in the upper and lower levels are surrounded by numerous columns supporting the structure above, the signal men will have to depend entirely on their electric indicators for their knowledge of the position of trains. This being so, it would have been entirely feasible to put all of the 760 levers in a single frame, on the fourth floor; but, after considerable study, it was concluded that the separate arrangement would best promote simplicity of operation. The minimum force of men in each cabin will be a director with one assistant and enough levermen to set the switches and signals with the requisite promptness.

The wooden cabinet which is to inclose this machine will have hinged doors for all of its openings, and these will be locked with Yale & Towne standard locks, thus affording protection against the leverman who yields to the temptation to pick an indication. The wires which extend from the machine to the switches and signals are led out through a series of small doors at the bottom of the cabinet. These wires all start from a terminal board on which connections are so made that any lever can be disconnected and taken out quickly without disturbing adjacent levers or interfering with the locking.

This machine in station B controls the switches and signals in a territory of about 23½ acres—that is to say, a yard, 3,000 ft. long and 600 ft. wide. The limits of this yard are Fifty-fifth street on the north and Forty-third street on the south; Lexington avenue on the east and Vanderbilt avenue on the west. South of Forty-third street there is an independent small cabin for the loops, one cabin for both levels. Diagrams of the tracks of these yards were given in connection with the description published in October, above referred to.

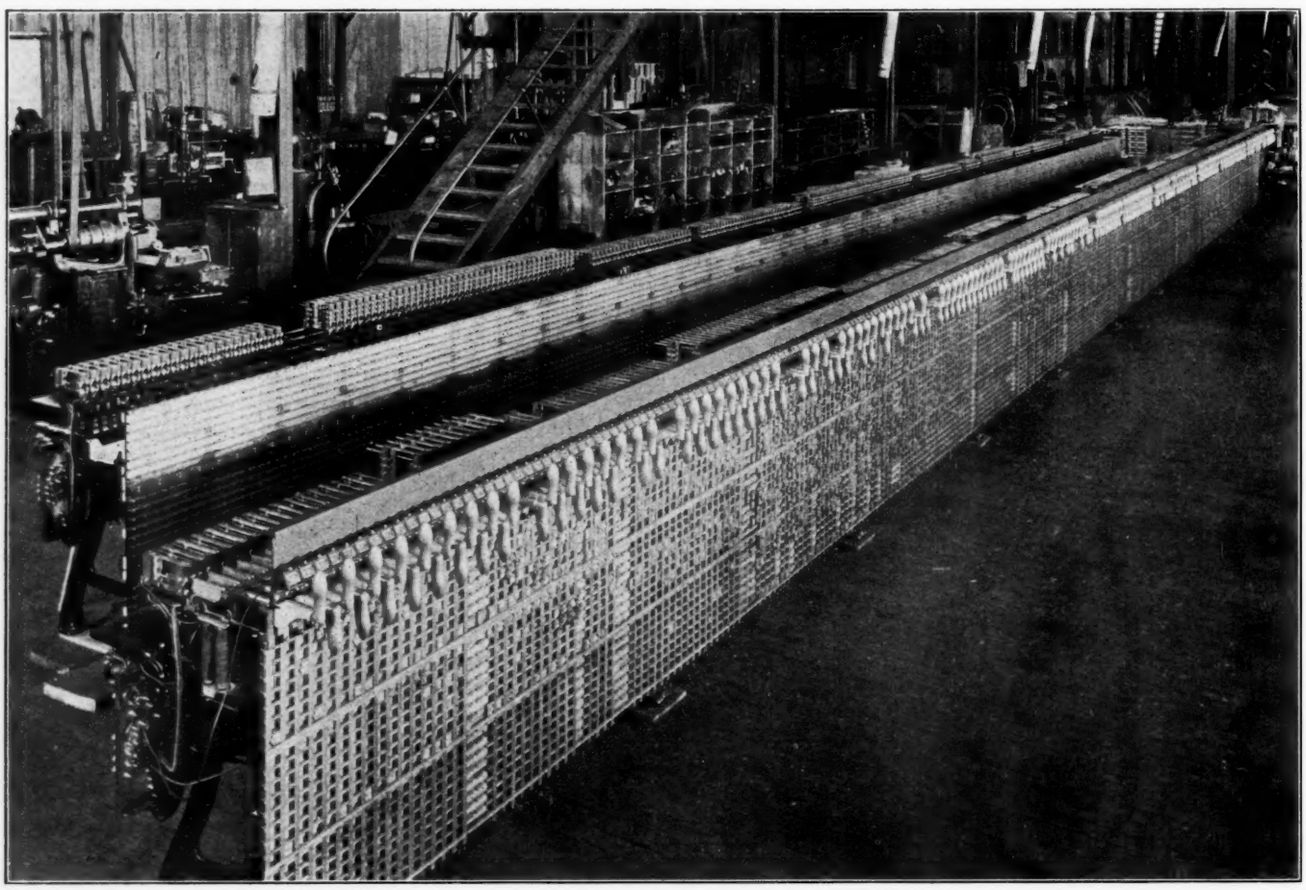
Station B, when put in service, will take the place of a 68-lever electric interlocking machine of the General Railway Signal Company, which is now in use at the east side of the yard, not far from the new building. A number of the tracks controlled from this temporary cabin are not in their permanent locations and will be superseded by others when the control is finally transferred to station B.

This will be the second permanent interlocking to be set up in the new terminal, the first having been the 144 lever machine at station U at the entrance to the yard (Fifty-seventh street), which was set up about a month ago.

REPLACING STEEL VIADUCTS ON THE BESSEMER & LAKE ERIE.

The Bessemer & Lake Erie has for several years been gradually replacing the steel viaducts on its line between Butler, Pa., and North Bessemer with concrete arches. This portion of the Bessemer & Lake Erie was built in 1897 as a single track line through a rough country and required 16 large steel viaducts and bridges, these structures being designed for about Cooper E-40 loading. Due to the increase in weight of the motive power and rolling stock these structures are too light for the present traffic. Also second track either has been constructed or is now under construction over the entire road, with the exception of about four miles. In designing structures for this heavier motive power and for the second track Cooper's E-60 loading has been used, and concrete arches are in most cases replacing the steel viaducts.

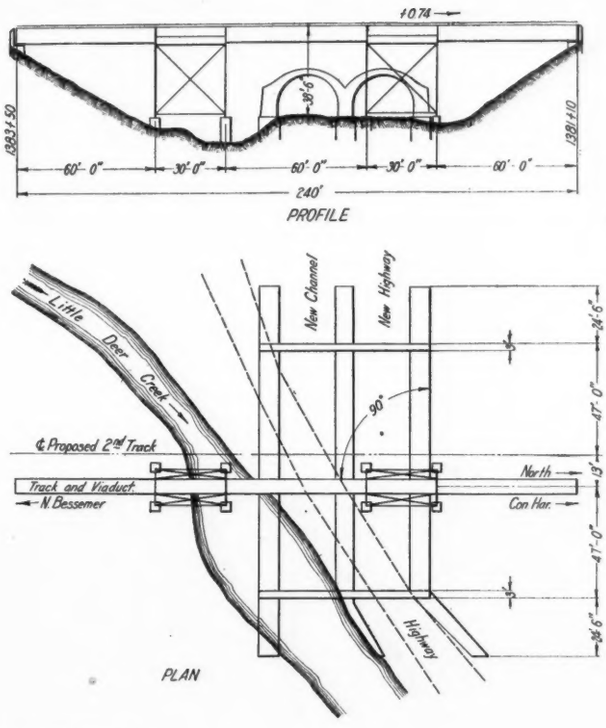
Since 1904 a steel viaduct near Frazier, 780 ft. long and 85 ft. above the stream, has been replaced with a double 26-ft. arch for the stream and a 33-ft. arch for a highway, 223,000 yards of material being required to fill the remainder of the structure. A viaduct near Rural Ridge, 240 ft. long and 42 ft. high, has been

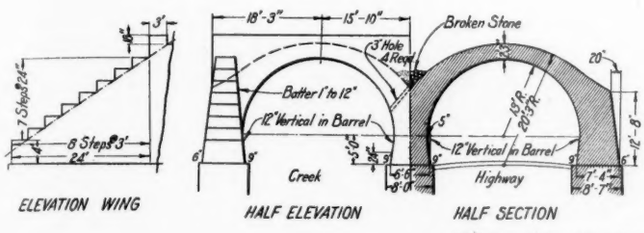


Electric Interlocking Machine of 400 Levers, for Signal Station "B"; Grand Central Terminal, New York City.

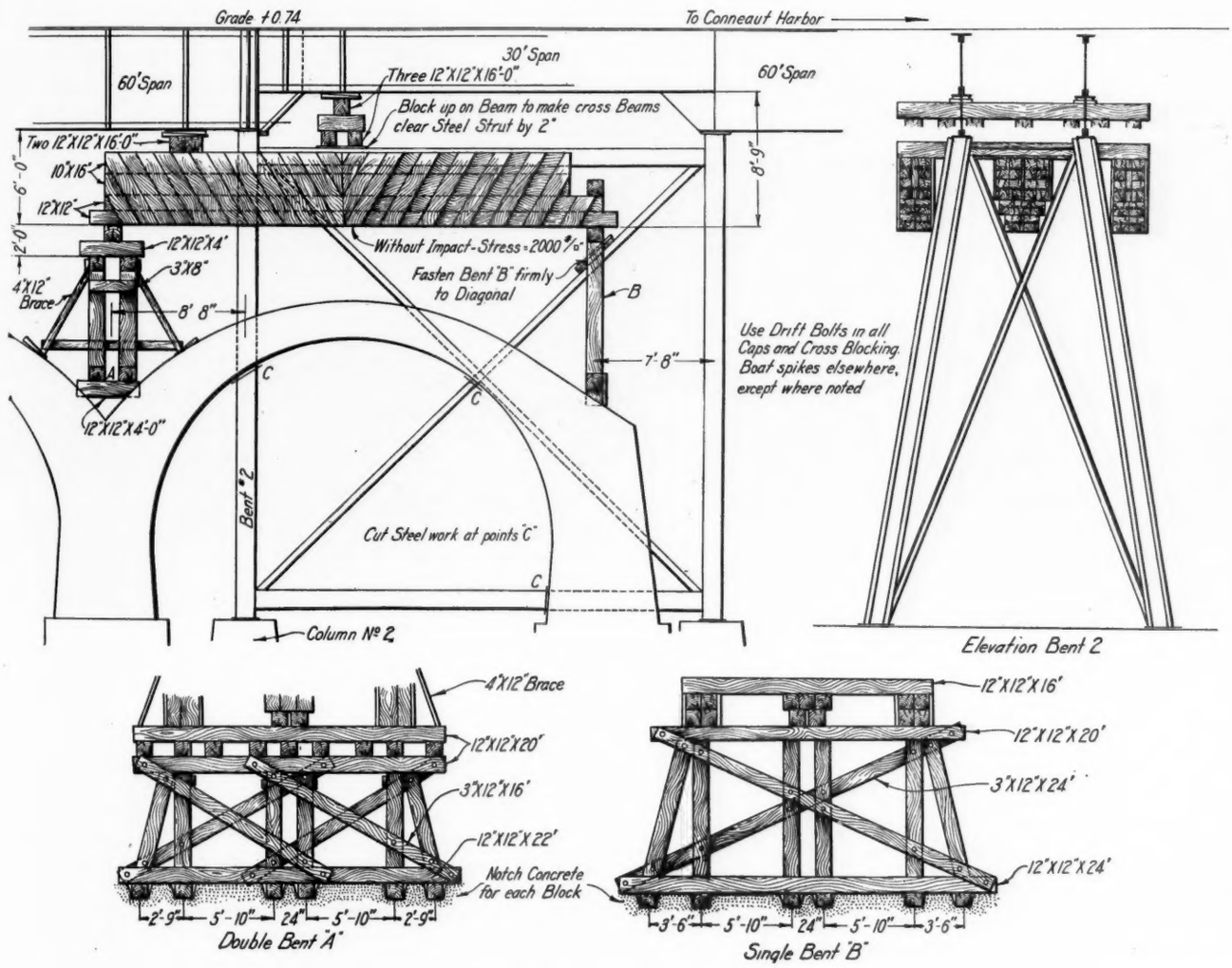
replaced by a double 26-ft. arch, one barrel of which provides an opening for a highway. Another viaduct near Rural Ridge 480 ft. long and 80 ft. high has been replaced by a double 12-ft. arch, while a viaduct near Milltown, 510 ft. long and 84 ft. above the stream, has been replaced by a 12-ft. arch for the stream and a 60-ft. girder span with concrete abutments for a highway.

It is also planned to double-track the line between Culmerville and Woods, 3.7 miles, in which stretch four viaducts of 600 ft., 420 ft., 480 ft. and 420 ft. will be replaced with concrete structures. At North Bessemer a temporary viaduct for construction purposes is now being erected to carry the traffic across Plum creek, while the old viaduct is being replaced by arches over Plum creek, over a branch of the Allegheny Valley Railroad and over a highway. This viaduct is being erected 110 ft. distant from the old line and will be bolted instead of riveted. A temporary structure is necessary because of the location at the north end of the Bessemer yard and within the switching limits, it being impracticable, otherwise to carry on the con-





Bridge No. 12, Near Rural Ridge, Pa.

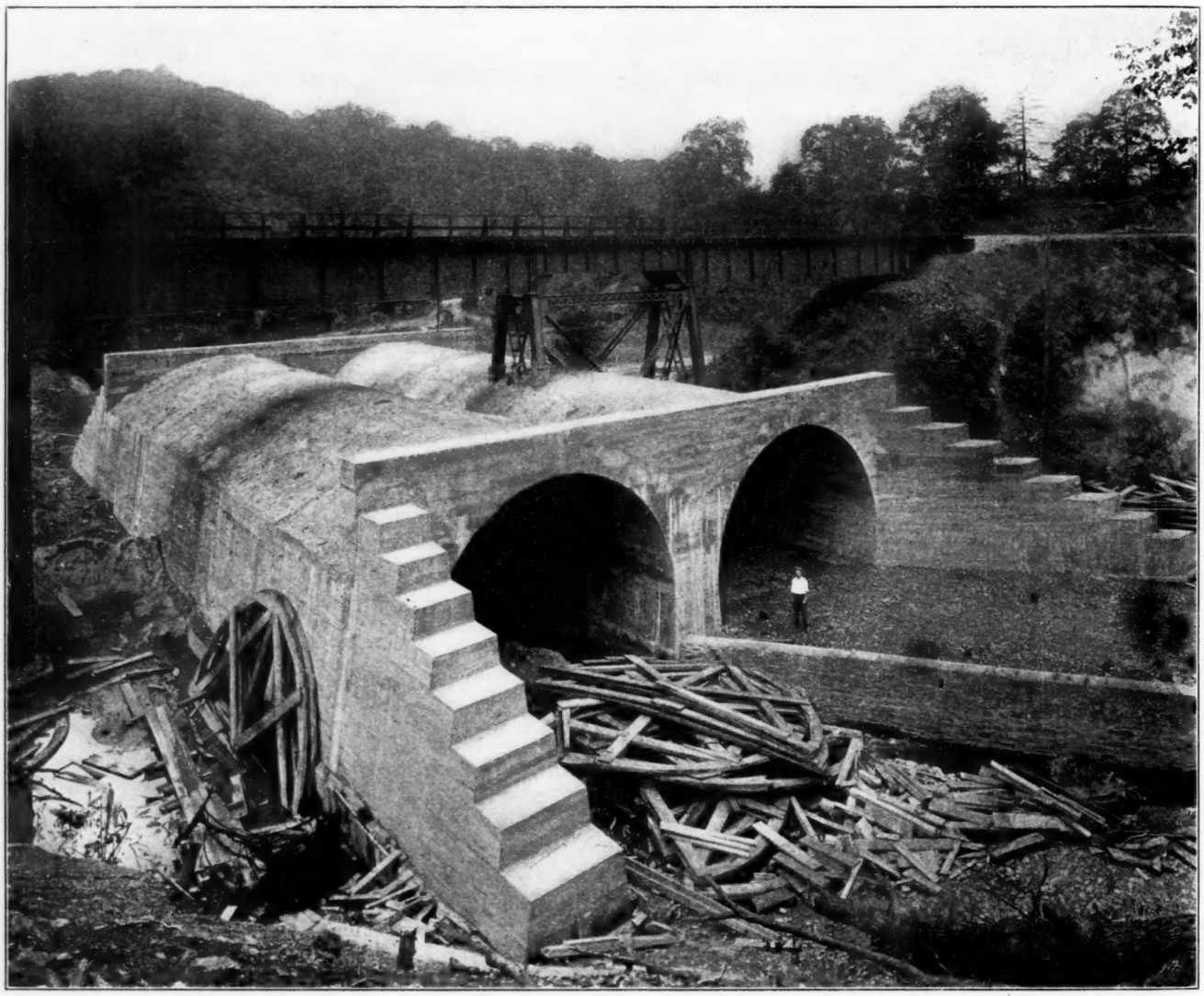


Temporary Support for Viaduct.

struction work and fill over the arches without serious interference to train and switching movements.

At bridge No. 12 near Rural Ridge, where the 240-ft. viaduct has recently been replaced by a double 26-ft. arch, some unusual methods of construction were necessary because of the fact that one ach is built about a tower of the viaduct, as shown in the accompanying plans. The cross section of the highway barrel was determined by the requirements of the Allegheny county highway department. While Little Deer creek is normally a stream with a small flow, it is subject to freshets, and the same section was considered necessary in the other barrel to provide sufficient waterway to protect the land lying above the arch. The middle wing on the east was in place when construction began, having been built by the highway department of Allegheny county before the arches were contemplated. The angle of the north wing on the east corresponds to the angle of the highway, while the wings on the west were made straight to facilitate a further increase in length. A full-sized foundation was put in for the middle wing and the arch was keyed for additions. One foot at the top of the bench wall was made vertical for convenience in handling the centers. Before the work was started a temporary highway was opened north of the site and a temporary creek channel was dug where necessary to the south. The arches were then built in three sections and completed, with the exception of the south wing wall on the east side, without interference with either of the streams or the traffic along the highway. The stream was then turned through the south barrel and the wing wall built.

During construction the steel members of the tower passing through the arch were boxed in so that the viaduct remained intact until the arches were completed. Before the highway barrel could be removed it was necessary to remove that portion of the tower which came within it and to support the dependent girders on the arches. The manner in which this was done is shown in the drawings a slow order of four miles an hour was maintained over the bridge while it was supported in this way and a carpenter was kept on the site day and night to see that there was no movement of the wedges and braces. After the load was transferred from the tower to the arches all the steel work inside the barrel was cut away, as shown on the drawing. When the fill is settled the girders will be removed.



Completed Double Arch.

There is no reinforcement of any kind in this structure, but a 1-3-6 mixture of Universal Portland cement and Allegheny river sand and gravel was used. The foundations were carried down to rock a distance of 10 ft. The amount of concrete, including the foundations, amounted to 3,284 cubic yards. This work was begun in April, 1910, and completed last October. It was designed and built by the T. A. Gillespie Company, New York and Pittsburgh, under the direction and supervision of H. T. Porter, chief engineer, and C. S. Leet, assistant engineer, of the Bessemer & Lake Erie, to whom we are indebted for the above information.

RULES FOR OBSERVING HOURS-OF-SERVICE LAW.

W. G. Bierd, vice-president and general manager of the Minneapolis & St. Louis and the Iowa Central, has issued, for the information of the officers and employes of those roads, a circular giving the essential parts of the federal hours-of-service law as related to trainmen; the rulings of the Interstate Commerce Commission interpreting the law, and a code of 11 rules showing how the law applies to particular situations. These 11 rules follow.

1. The responsibility for the observance of the law is upon those officers and agents of the company who direct and control train movements. Trainmen, enginemen, yardmen and telegraphers are, therefore, free to obey the orders of the despatcher, or of the train master or superintendent when such officers assume the control of train movements.

2. When not able to communicate with the despatcher or any superior officer the conductor of a train will assume the responsibility, as he is then the agent of the company in control of the movement of his train and he will tie up or proceed as the law may require under the circumstances.

3. Conductors will be expected to notify the despatcher a reasonable time in advance of the expiration of sixteen hours on duty for any member of the train or engine crew, but will then proceed or tie up, as the despatcher may direct.

4. The period "on duty" begins at the time required to report for service, and ends when relieved from service. Despatchers must make due allowance for the time ordinarily so consumed in securing relief after arrival at terminal or relay point.

5. A relay point is an intermediate station between terminals at which provisions have been made to terminate, exchange and start crews; to care for and furnish fuel and water to engines; and at which facilities exist to store and switch trains clear of the main line. . . .

6. The movement of trains should be so directed that trains will not need to tie up at stations other than relay points and terminals.

The despatcher will not permit a train to pass a relay point or leave a terminal unless it has sufficient time, all customary and usual delays being considered, to run to the next relay point or terminal before the expiration of sixteen hours. If after passing a relay point or leaving a terminal a train is delayed by a "casualty," or "unavoidable accident," or by reason of a cause that could not have been foreseen, the crew may lawfully continue on duty to the next relay point or terminal.

7. The despatcher in directing the movement of a train, the crew of which is approaching the limit of time on duty, will make reasonable allowance for conditions known by him to exist, including the state of repair or efficiency of the locomotive or cars in the train, physical characteristics of the road, the state of the weather, the performance of the train during the earlier part of trip, the tonnage of the train and all things which in his judgment as a man skilled in the operating of trains, may retard its movement.

When in the judgment of the despatcher, having considered all the known conditions and ordinary contingent delays, there is sufficient time for the train to run from a terminal or relay point to the next terminal or relay point, and he directs the crew to continue on duty he should then closely follow its movement.

If the train fails to make the expected run the precise reason must be ascertained and if caused by a "casualty," "unavoidable accident," or act of God, or any occurrence which could not have been foreseen and guarded against, the crew may continue on duty as intended to the next relay point or terminal; but if no such casualty, unavoidable accident, act of God, or occurrence is evident, and the train has suffered delays from usual and ordinary causes, such as meeting trains, local work and switching, doubling hill at point where trains often but not always double, engine not steaming well, etc., the despatcher must conclude that his first judgment was in error, that the train should not have been permitted to leave the last terminal or relay point and it must, therefore, be tied up before the expiration of sixteen hours on duty and another crew sent to relieve it.

This would occur only in the case of an error in judgment on the part of the despatcher or officer directing the movement, as, if his first judgment was accurate the delay must have been unavoidable and unforeseen, giving the crew the right to remain on duty.

8. When, in the judgment of the despatcher, there is not sufficient time for a train to leave a relay point and run to the next terminal or relay point which notwithstanding he directs the crew to proceed with the intention of relieving them en route, said crew must tie up before the expiration of sixteen hours at the last convenient point possible to reach within the time limit. The train must be on siding and the crew relieved of all responsibility for its protection. Unless something unforeseen has occurred in the movement of the train on which the relief crew is traveling to meet or overtake the crew to be relieved (again excepting possible error in judgment), the relief crew will reach the delayed train before its crew must cease duty.

9. Hot boxes, either on cars or engines, bursted air hose and cleaning fires or ash pans, must not be regarded as casualties, accidents or unforeseen occurrences. The despatcher or person directing the movement of a train must allow in addition to the running time, reasonable time for the crew to care for such hot boxes by treating them or setting the cars out; to put on an air hose or hoses and to clean ash pans or fires, as these delays are common to the movement of all trains and engines.

10. It will be seen from the above that the necessity for relieving employes at points other than relay points and terminals can arise from only two causes.

First—By error in judgment in permitting a train to leave a relay point or terminal without sufficient time to reach the next terminal or relay point.

Second—By deliberate arrangement to proceed from a relay point or terminal to be met or overtaken by a relief crew.

In either event the crew must not remain on duty beyond the sixteen-hour limit.

11. When a crew for any reason has been permitted to remain on duty more than sixteen hours, the officer or agent of the company (usually the train despatcher) who has controlled the movement of said crew, must make and preserve a full and complete record of all facts and conditions affecting said movement and causing such train crew to remain on duty in excess of sixteen hours.

NEW RAILWAY FOR BOLIVIA.

A representative of the Bolivia Railway Company has made a proposal for the final survey of the railway from Potosi, Bolivia, to Sucre. Under the arrangement referred to, the Bolivia Railway Company agrees to make a definite survey and to submit it to the government for approval within one year from the date of its acceptance of this proposal. For these plans the government agrees to pay the railway company $75,000, which is the estimated minimum cost of the survey, and, all things being equal, to give the Bolivia Railway Company the preference in the construction of the said railway. The law of November 27, 1906, provides that the revenue from the sale of the Guaqui to La Paz Railway shall be applied to the construction of the Potosi to Sucre Railway. The commercial interests of Bolivia, and especially the city of La Paz, are urging the construction of this railway, which will penetrate one of the richest, most populous, and progressive sections of the republic. It will open up to development and exploitation an immense territory of the country which has up to this time been extremely difficult of access.

General News Section.

An anti-pass bill has been passed by the Illinois senate by a vote of 34 to 12.

The new union station at Tacoma, Wash., was formally opened on May 1. Howard Elliott, president of the Northern Pacific, delivered an address in connection with the dedication ceremonies.

Rene Vallon, a French aviator, fell from a great height at Shanghai, China, last Saturday and was killed. Vallon is said to be the 53d man to lose his life in experiments with heavier-than-air flying machines.

The New York state senate has passed by a vote of 26 to 14 the Bayne bill permitting the formation of corporations to issue stock having no par value. This bill passed both houses of the last legislature, but was vetoed by Governor Hughes.

In the Federal court at Prescott, Ariz., suits have been filed against the Atchison, Topeka & Santa Fe, alleging 190 violations of the 16-hour law, as applied to the working hours of trainmen; and at Los Angeles, Cal., similar suits alleging 60 violations.

The Atchison, Topeka & Santa Fe has arranged for "information meetings" to be held at points along its lines where officers and employees who have to do with the handling of freight will discuss methods for reducing loss of and damage to freight shipments.

The Chicago, Burlington & Quincy, which was one of the first roads to use telephones for train despatching, has ordered from the Western Electric Company 27 of its new selectors and associated telephone equipment for use on the St. Joseph division, from Kansas City to Napier, 96 miles.

The Missouri, Kansas & Texas has ordered from the Western Electric Company selectors and telephones for a telephone despatching line from Dennison to Hillsboro, via Dallas, 172 miles; for a branch 22 miles long; and for the Fort Worth division, 152 miles long, with a branch of 9 miles.

Beginning August 14 the Chicago, Rock Island & Pacific will run through passenger trains between Memphis, Tenn., and California points. Trains will be run daily between Memphis and El Paso, Tex., where connection will be made with the "Californian," on which the trip to the coast will be completed. First class Pullman and chair cars will be provided, and when the traffic warrants it, through tourist sleeping cars will be put on.

The Pennsylvania Railroad appears to have been able to keep its shops running sufficiently to meet all pressing demands for cars, in spite of the strike on the Pittsburgh division. A press despatch of Monday last said that preparations were being made to resume work on the repair of freight cars, though the company already has 40,000 idle cars. About 200 shop men of the Baltimore & Ohio, at Glenwood, near Pittsburgh, went out on strike last Monday.

After making a trip through the switching district of Chicago on May 8, members of a special committee of the Illinois house of representatives, appointed to investigate the desirability of the proposed "full crew" law, which requires railways to employ a crew of six instead of five men on all through freight trains in Illinois, were convinced that the employment of an additional man was neither necessary nor desirable. Inquiries made of railway employees brought out the same opinion.

The freight handlers on the terminal roads in Chicago are adjusting their grievances with individual freight departments, and the threatened strike has been averted. The wage scale will remain the same as last year, but in some cases certain working conditions in the freight houses will be improved by the new contract. The maintenance-of-way employees belonging to the International Brotherhood of Maintenance of Way Employees are still on strike, but the roads involved report little trouble in keeping their tracks in order.

Figures of operating revenues and expenses made public by 32 of the roads doing business in Texas, which carry 98 per cent. of the traffic, show that in the eight months ending March 1 they suffered a net deficit of $1,472,000. In the corresponding months of the previous year they had a surplus of $151,400. Their total operating revenues for the period just ended were $4,750,128, or 7.02 per cent. greater than in the previous year, while the operating expenses, not including taxes, rents, etc., increased $4,193,858, or 8.52 per cent.

The Canadian government has introduced in the Dominion parliament a bill to amend the general railway law. It is proposed to put telegraph, telephone and express companies under the law on the same basis as railways; to empower the board of railway commissioners to make rules for the protection of property adjacent to railways against fire; to require new railways to be fenced, unless the commissioners grant an exemption, and to give the commission new powers in other directions. The bill would repeal the law under which animals may not be allowed to run at large within a half mile of a railway.

For the through passenger train service of the Chicago, Milwaukee & St. Paul and the Chicago, Milwaukee & Puget Sound from Chicago to the Pacific coast, which, as previously announced in these columns, will be inaugurated on May 28, all-steel trains will be used, 20 complete trains being required for the service. The "Olympian," which will leave Chicago every evening, will run on a three-day schedule, and the morning train out of Chicago, the "Columbian," will make the run in 75 hours. On these trains tea will be served without charge in a tea room which forms one of the compartments of the observation car.

At the Mt. Clare shops of the Baltimore & Ohio in Baltimore, lessons in English are now given three days each to men of foreign birth employed in the shops. These lessons are given in the noon hour. The Roberts system of teaching languages is followed, under which one teacher is able to instruct an unlimited number of persons of different nationalities. The examples used have to do with the common affairs of everyday life. The Young Men's Christian Association co-operates with the officers of the company in this matter. The Y. M. C. A. also carries on a class in technical education for apprentices.

On Monday night last conversation was held between New York City and Denver, Colo., 2,011 miles, over the wires of the American Telephone & Telegraph Company. Two metallic circuits were used, and Morse telegraph messages were being sent over the wires at the same time. The voices of the men in Denver were heard in New York as distinctly as were words spoken in Chicago, between which city and New York telephone conversation has been carried on for many years. The line between New York and Denver is of copper No. 8 B.W.G., and the number of poles in the 2,011 miles is 87,000. The charge for the use of the telephone between New York and Denver for three minutes is $11.25.

In a recent newspaper interview James J. Hill said that he believed publicity of corporation matters and intelligent public control is needed for the industrial prosperity of the country. He said the business of the country increased 15 per cent. every year, while the transportation facilities for handling it increased only one-sixth of that amount, and this because the men behind those facilities, uncertain as to what public regulation may do, are afraid to invest their money for extensions and improvements. One of the effects of publicity will be, said Mr. Hill, that when the public begins to see corporation affairs from the inside much of the feeling against big business concerns will pass away, and the antagonism which now exists between the people and quasi-public corporations will disappear.

The Manager's Eye is on You.

Agents should never permit their interest to wane on account of not being continually complimented, as their good work, characteristics and qualifications for promotion are frequently discussed by officers of the company and advancement considered when opportunity affords, regardless of the fact that advancement may seem slow. Many presidents and other high officials of railways point with pride to the fact that the proper handling of the smallest and most remote stations was the primary cause to which was attributable their final success.—*H. J. Slifer, General Manager, Chicago Great Western, in circular to agents.*

A Broad Commission.

Certain western roads in their efforts to cultivate that friendliness between employees and officers which is essential to the most complete success, and which has been so greatly jeopardized by the enormous growth of railway companies, have standing notices or offers, to the effect that whenever an employee can suggest an improvement in the service he will be paid for the suggestion. One company, we believe, fixed a price of a dollar an idea, but with the intention, no doubt, of paying a reasonable price for such ideas as should prove to be worth large sums. Most of these proposals have been made, originally, in connection with the system of discipline without suspension—Brown's discipline; but now the idea has been adopted by the Pennsylvania, which has not adopted Brown's discipline. General superintendent J. G. Rodgers, of the Buffalo & Allegheny Valley division of that road, has issued a circular, General Notice No. 2, telling his men that "ideas are worth money; develop them and we will pay you for them." As an outline of what is wanted, the circular sets forth the following:

"SUGGESTIONS

Must contain ideas which will—
Increase efficiency of operation,
Improve methods of operation,
Be beneficial from economical standpoint,
Increase safety and convenience of passengers and patrons of our company,
Increase patronage,
Promote safety of employees.
In any way promote the interests of the company, whether pertaining to improved mechanism, better office practice or other features.
May involve the use of new methods or the modification of old ones,
May include the comfort or betterment of employees.
Must not include personal complaints or antipathies."

All employees have in the past been free to make suggestions, we are told, but Mr. Rodgers now puts the matter in more definite form. Moreover, employees may offer advice concerning things outside of their own department. Nothing could be more liberal than that. Even a Roosevelt could find scope for his mental energies.

Vox Populi.

I was sitting on my porch in Reading, after dinner, smoking a cigar, when up the walk came a very tall man with a carpet bag in his hand. He stopped at the bottom of the steps and said, "Be you the president of the Reading Railroad?" I drew up my shoulders and said I was. Then he walked up the steps and said, "What is the price of a ticket from here to Niagara Falls and back?" I said, "My dear friend, I do not know. You will have to go down to the ticket office. Do you know where it is?" He said, "Yes," and then he picked up his carpet bag, looked at me, and said, "You are the president of the Reading Railroad, and don't know the price of a ticket to Niagara Falls and back!" Well, I said I didn't. Then he walked down the steps and turned and said, "You're a hell of a railroad president!"—*George F. Baer,* before the Traffic Club of Pittsburgh.

Plain Talk in Massachusetts.

One bill has just come out of the railway committee of the Massachusetts Legislature which should be made short work of. It provides that on the steam railways of this state no person shall act as engineman unless he shall have been employed two years as a locomotive fireman or engineman's helper; and that no person shall act as conductor unless he shall have been employed as a brakeman for two years. This on its face might seem to be all right—merely providing that railways shall employ men of experience in locomotives and on trains for these responsible positions. And this is no more than what railways do and always will do so far as they are able, without statutory requirement.

Clearly, then, this bill must have a hidden or ulterior purpose, and it is not hard to find. It is evidently designed to make effective any demands which the enginemen and conductors may make on the railways. It would either enable the enginemen and conductors to assume the management of the roads for their own profit exclusively; or it would enable them to tie up the lines completely for the loss of everybody in the railway service, the suspension of manufacturing industry and the starvation of the cities. For, under this bill, if the enginemen and conductors should make wage or other demands which the roads could not meet, they could strike and their places could not possibly be filled, since there would never be a supply of available help within reach meeting the requirements of this proposed enactment.

The case needs no argument. The provisions of the bill and the known conditions of expert railway labor supply tell the story on their face. The public welfare is as much and more concerned over such a proposal than the railways. Some states have a law of this kind, but with an emergency section suspending the requirement of experience in cases of strike or other exceptional difficulty. The committee reporting this bill favorably refused to attach an emergency section. With such a section it would merely be a law for the better protection of the public in the use of railways. Without such a section we should have a law whose incidental purpose would be the better public protection and whose primary purpose would be to deliver the railways into the hands of these two classes of employees. That the latter should have made so extraordinary a demand upon the legislature is surprising enough. But what shall be said of legislators who are willing to yield to this demand?—*Springfield Republican.*

Railways Before the State Tax Board.

Herewith are a few headlines of newspapers reporting the proceedings before a certain state tax board. Presumably the railway officers appearing before this board are not the same as those selected to negotiate the sale of securities to foreign bankers.

ROAD THAT NOBODY APPEARS TO COVET.

Corned Beef and Cabbage Route Often Put up for Sale, but Never Sold.

ROADS OBJECT TO STATE TAX LEVIES.

Railway Officials Plead Before Board of Commissioners for Reductions.
State of Unrest, Factor.

DEFICIT FORECAST IN RAIL REVENUES.

Tax Board is Informed That Operating Expenses Soon May Surpass Roads' Incomes.
"Hard Times" Tales Told.

HIGH FINANCE TALE IS TOLD TAX BOARD.

Erie Railroad Agent Asserts Company Was Looted of Millions of Dollars.
Asks Assessment Reduction.

SAYS PENNSYLVANIA HAS MORE FAVORABLE TERMS.

New York Central Man's Contention Before Tax Board.

FEELS BLUE OVER THE OUTLOOK OF BUSINESS.

In real candor the man represented in the last heading surely leads. Of course, one's feelings, not his professional opinion, should be the basis of one's words in so serious a matter. And if the conditions on this man's road are anywhere nearly so bad as on the others, his blueness is in the highest degree justifiable.

The Pennsylvania's Forestry.

The Pennsylvania Railroad Company's forester reports that since the company undertook forestry work on a comprehensive scale more than four million trees have been set out; 617,338 of these last year, on tracts aggregating 650 acres. There were 200,000 trees planted at Altoona; 49,189 at Mount Union; 93,700 near Martic Forge; 65,500 at Newton Hamilton; 62,249 at Petersburg; 36,100 near Middletown; 12,000 at Vineyard; 10,000 at Ryde; 27,750 at Rambo; 5,000 at Conewago; 3,500 at Kinzer; 17,250 at New Brunswick, N. J., and 35,100 at Parkton, Maryland.

The nursery at Morrisville, Pa., covers 32½ acres, affording a capacity of a million trees a year. To replace the seedling trees transferred last year 269 bushels of acorns and 116 pounds of seeds from coniferous trees were planted. The total output of

the nursery during the year was 766,924 trees, and the stock on hand at the close of the year was one and one-half million forest trees, and 137,200 ornamental plants. The following table shows the planting done in the last nine years:

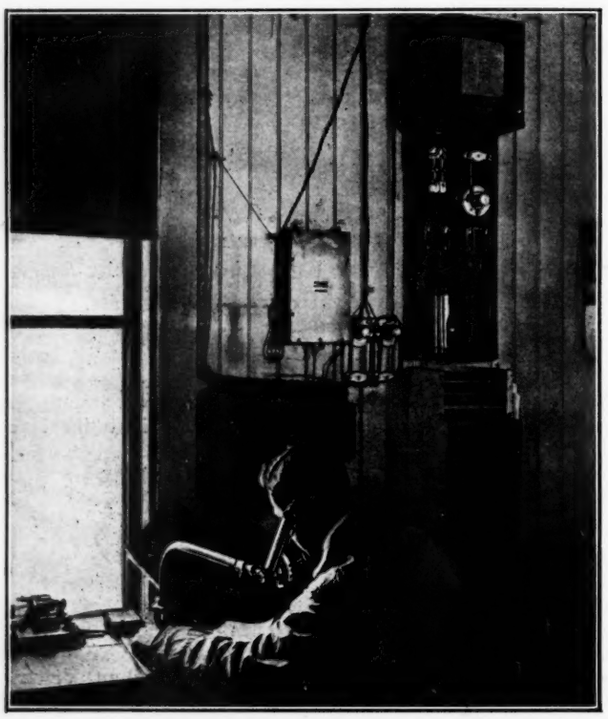
Years.	Number of trees planted.
1902	13,610
1903	43,364
1904	223,656
1905	597,165
1906	801,625
1907	448,226
1908	300,530
1909	1,054,010
1910	617,338
Total	4,099,524

For beautifying lawns around stations and unoccupied places along the roadway, there were imported from France during the past year 41,699 deciduous ornamental plants, 5,480 coniferous ornamental trees and 107,935 coniferous forest seedlings.

The Pennsylvania has two large timber treating plants, both using the pressure treatment, one at Mount Union and the other at Greenwich Point, Philadelphia. These plants have a combined capacity of a million and a half cross-ties yearly. In 1910 there were treated 671,369 ties, four and one-half million feet of lumber and switch timber, 5,432 fence posts, 10,592 cross-arms, 55,212 lineal feet of poles, and 90,306 paving blocks. To do this required the use of 2,866,513 gal. of creosote oil, all of which was imported from Europe. To foster intelligent forest development on the part of the public generally, the company furnishes to private corporations and individuals trees and plants not required for its own uses. Last year over 70,000 plants were disposed of to outside individuals.

Telephone Train Despatching on the Central Vermont.

The Central Vermont has lately put in use a telephone train dispatching circuit from St. Albans, Vt., southward to Windsor, a distance of about 150 miles, including a short branch. There are 38 way-stations on the line. The selectors and telephones were furnished by the Western Electric Company, Chicago. The way-stations on this circuit are fitted with the Van Akin telephone arm, by means of which an operator sitting at his table can keep the telephone at his ear while at the same time



Station Telephone, Central Vermont.

having both arms free; and if he has to turn quickly to some other duty he can get away from the telephone without the delay incident to taking off and hanging up a head set. The appearance of the Van Akin arm is illustrated in the accompanying photograph. The whole telephone set is included in the arm, and the swinging of the arm away from the operating position turns a switch, cutting the telephone off from the line. In connection with this installation, the Central Vermont has equipped two wrecking cars with portable telephone sets, each mounted in a wooden box, fitted with writing shelves. The box and the telephones together furnish a complete temporary office outfit for an operator who may have to open an office at a wreck.

Long Distance Automobile Freight Trip.

The running of an automobile truck from New York to Philadelphia and back in one day has already been noticed in these columns. The trip was made on April 7, and the makers of the truck in their advertisements give the cost of the trip as a trifle less than 20 cents a mile. The capacity of the wagon was 4½ tons and the load consisted of 4 tons of merchandise and 6 men. The time southward was 7 hours 35 minutes, including ferry delays of 35 minutes. The return trip with 3 tons and 6 men was made in 7 hours. The details of the cost are given as follows:

Driver ($20.00 a week) day's work plus 5 hours at time and one-half	$6.16
40 gallons gasoline at 11c.	4.40
Three pints lubricating oil	.20
Grease	.20
Maintenance 4c. a mile (based on maintenance contract)	8.80
Tires 7c. a mile (based on manufacturer's guarantee)	15.40
Insurance at 50c. per day (approx. $150 per annum)	.50
Depreciation 3c. a mile (based on proved records)	6.60
	$42.26

The distance covered was 220 miles. [The distance between the two cities by rail is 90 miles—Editor]; approximate cost per mile, 19.8 cents; average running time, 15¾ miles an hour. No adjustments were needed en route. There were no scratches on the tires, although the truck had to go over a good bit of crushed stone. These loads to and from Philadelphia would have cost nearly twice as much by express. The time necessary to express them, including time of unloading and carting to and from trains to the stores, would have been considerably more than the time the truck took. That same truck did over 800 miles of continuous demonstration service during the week of the run.

New York Railroad Club.

The next regular meeting of the New York Railroad Club will be held at the building of the United Engineering Societies, New York, May 19. The technical paper for this occasion will be on The Possibilities of the Oxy-Acetylene Torch in the Railroad Shop by Prof. J. M. Moorehead, of Chicago. It will be illustrated with practical demonstrations.

Central Railway Club.

At the next regular meeting of the Central Railway Club, to be held at the Hotel Statler, Buffalo, N. Y., May 12, G. K. Heyer, railway sales engineer of the Western Electric Company, Chicago, will present a paper on Train Despatching by Telephone. This will be the last session preceding the summer vacation.

American Electric Railway Association.

The annual convention of the American Electric Railway Association will be held at Atlantic City, N. J., October 9-13. H. C. Donecker, secretary, 29 West Thirty-ninth street, New York.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

Air Brake Association.—F. M. Nellis, 53 State St., Boston, Mass.; annual convention, May 23-26, Chicago.

American Association of Demurrage Officers.—A. G. Thomason, Scranton, Pa.; next meeting, June 22, 1911, Niagara Falls, N. Y.

American Association of General Passenger and Ticket Agents.—C. M. Burt, Boston, Mass.; next meeting, St. Paul, Minn., Sept. 19, 1911.

American Association of Freight Agents.—R. O. Wells, East St. Louis, Ill.; June 20-23, Kansas City, Mo.

American Association of Railroad Superintendents.—O. G. Fetter, Carew building, Cincinnati, Ohio; 3d Friday of March and September.

American Electric Railway Association.—H. C. Donecker, 29 W. 39th St., New York; October 9-13, Atlantic City, N. J.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York; May 17, New York.
AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago; Oct. 17-19, 1911, St. Louis, Mo.
AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, Monadnock Block, Chicago.
AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.
AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago; June 14-16, 1911, Atlantic City, N. J.
AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—O. T. Harroun, Bloomington, Ill.
AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.; June 27-July 1, Atlantic City, N. J.
AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.
AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—D. J. Haner, 13 Park Row, New York; 3d Tuesday of each month, New York.
AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York; next convention, May 30-June 2, Pittsburgh, Pa.
ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago.
ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; May 24-26, Montreal, Can.
ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago; semi-annual, June 16-17, Washington, D. C.
ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; June 19, 1911, Boston, Mass.
ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 24 Park Pl., New York; June 20-21, Cape May City, N. J.
CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tuesday in month, except June, July and Aug., Montreal.
CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays, Montreal.
CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.
CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan., and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.
CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—D. F. Jurgensen, 116 Winter St., St. Paul, Minn.; 2d Monday, except June, July and Aug., St. Paul.
ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.
ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.
FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va.; June 21, St. Paul, Minn.
GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—H. D. Judson, 209 East Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.
INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; May 23-26, Omaha, Neb.
INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.
INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago; May 15-18, 1911, Chattanooga, Tenn.
INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn.; July 25-27, Chicago.
INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio.
IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August, Des Moines.
MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago; June 19-21, 1911, Atlantic City, N. J.
MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION, OF UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass.; Sept. 12-15, 1911, Atlantic City, N. J.
NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.
NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.
NORTHERN RAILWAY CLUB.—C. L. Kennedy, C., M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.
OMAHA RAILWAY CLUB.—H. H. Maulick, Barker Block, Omaha, Neb.; second Wednesday.
RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.
RAILWAY CLUB OF PITTSBURGH.—C. W. Alleman, P. & L. E., Pittsburgh, Pa., 4th Friday in month, except June, July and August, Pittsburgh.
RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa.; June 13, New York; annual, Oct. 10, Colorado Springs, Colo.
RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio; annual, May 22-24, 1911, Milwaukee, Wis.
RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.
ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; September 12-15, St. Louis, Mo.
ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.
SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago; Sept. 12-14, St. Paul, Minn.
SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.
SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.
TOLEDO TRANSPORTATION CLUB.—L. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.
TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.
TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.
TRAFFIC CLUB OF PITTSBURGH.—T. J. Walters, Oliver building, Pittsburgh, Pa.; meetings monthly, Pittsburgh.
TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 20, 1911, Baltimore, Md.
TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.
TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.
TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y.; annual, August 29-September 1, Chicago.
WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.
WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except, June, July and August.
WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Wednesday in month except July and August, Chicago.
WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, First National Bank bldg., Chicago.

Traffic News.

The Long Island road reports that it has not killed a passenger in a train accident since June 1, 1893; and during that time its passenger mileage has been 4,904,736,994; and nearly all of these passengers have been carried on the suburban lines of the company, carrying a dense traffic to and from New York City.

The Travelers' Protective Association and merchants and manufacturers have protested against that part of the uniform baggage rules recently adopted by the railways of the United States and Canada, by which it is proposed after January 1, 1912, to make an extra charge for all trunks any dimension of which exceeds 40 in., the charge to be made on a basis of ten pounds for every additional inch. On account of these protests the roads in the Trunk Line Association (east of Buffalo and Pittsburgh) have increased the dimension limit to 45 in.

Referring to the recent decision of Judge Trieber in the Arkansas rate cases, by which the temporary injunction restraining the state railway commission from enforcing its 2-cent passenger fare and reduced freight rate orders was made permanent, the commission has announced that if the general assembly of the state will not make the necessary appropriations to enable the case to be carried to the Supreme Court of the United States, it intends, if conditions warrant, to prepare and put into effect new freight tariffs on all classes and commodities.

The New York Central has brought suits in equity in the United States Circuit court against 21 merchants and other persons in Newburgh, N. Y., on the charge of illegal dealing in tickets. Season tickets have been bought in fictitious names, and such tickets costing 19 cents a trip, have been lent to persons unauthorized to use them, the price to such users being a dollar a ride, whereas a single trip ticket for this same journey would cost $1.25. It is said that this practice of cheating the road in the use of commutation tickets has been common at Newburgh for a long time.

Franklin K. Lane, of the Interstate Commerce Commission, spoke Wednesday night before the Finance Forum of the West Side Young Men's Christian Association of New York on the misunderstanding in regard to railways. He said, in his opinion, this was a time of real regulation of the railways, but that regulation was only incidental in the general purpose of the people to have more to say in regard to the management of their affairs. The trouble with the New York idea of the railway problem was that Wall street thought a railway was only a basis for a stock issue. The West, on the other hand, thought that a railway was entirely a public servant.

Westbound shipments of freight from New York by the nine trunk lines during 1910 to Buffalo, Pittsburgh and beyond, amounted to 1,986,806 tons, an increase of 113,514 or 6 per cent. over the preceding year. The movement in 1909 was 16.2 per cent. above that of 1908. Since the beginning of the current calendar year the shipments each month have shown a decrease as compared with the corresponding months of 1910. The figures of the different roads for the past three years, as reported by the *Wall Street Journal*, are as follows:

	1910.		1909.		1908.	
	Tons.	P. C.	Tons.	P. C.	Tons.	P. C.
Pennsylvania	395,916	19.9	353,928	18.9	305,769	19.0
New York Central	397,813	20.0	334,415	17.9	397,503	18.5
Erie	257,615	13.0	232,245	12.4	211,728	13.1
Baltimore & Ohio	168,980	8.5	151,977	8.1	118,384	7.3
West Shore	92,044	4.6	108,208	5.8	114,326	7.1
D. L & W.	302,686	15.2	243,960	13.0	233,570	14.5
Lehigh Valley	269,906	13.6	240,399	12.8	209,121	13.0
Central New Jersey	55,375	2.8	49,490	2.6	37,556	2.3
N. Y. Ont. & West	46,471	2.4	158,730	8.5	83,884	5.2
Total	1,986,806	100.	1,873,292	100.	1,611,841	100.

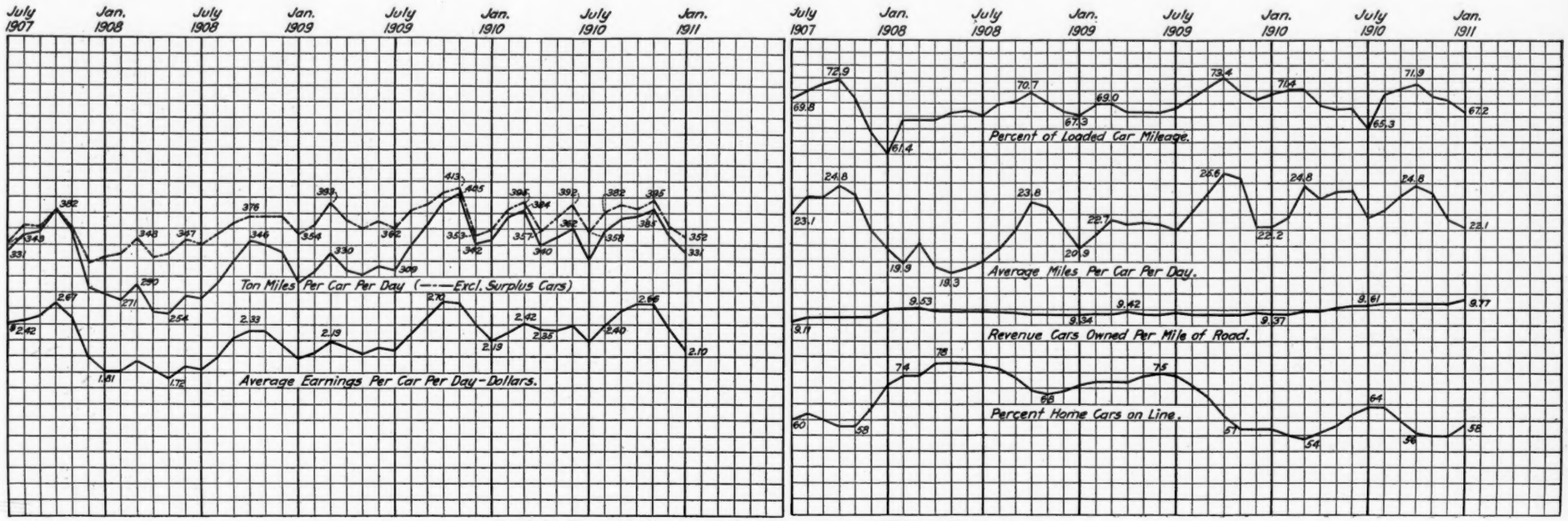
Freight Car Balance and Performance.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association in presenting statistical bulletin No. 96, covering car balance and performance for January, 1911, says:

"So far as general results are concerned there was little in the performance for this month to differentiate it from an average January performance. While the business as a whole

Car Balance and Performance in January, 1911.

	New England.	N. Y., N. J., Del., Md., Eastern Pa.	Ohio, Ind., Mich., Western Pa.	Va., W. Va., No. and So. Carolina.	Ky., Tenn., Miss., Ala., Ga., Fla.	Iowa, Ill., Wis., Minn.	Mont., Wyo., Neb., Dakotas.	Kan., Colo., Okla., Mo., Ark.	Texas, La., New Mex.	Ore., Idaho, Nev., Cal., Ariz.	Canadian Lines.	Grand Total.
Revenue freight cars owned	75,708	712,397	222,214	181,103	169,522	389,573	17,957	137,279	26,693	141,858	106,095	2,180,398
Average number of system cars on line	39,180	413,325	124,355	98,802	86,199	263,886	6,630	77,285	19,230	64,619	71,570	1,265,081
Railway-owned cars: Average foreign on line	39,656	285,513	104,394	76,016	72,204	128,191	12,753	65,663	24,180	53,328	32,200	894,098
Total Railway-owned cars on line	78,836	698,838	228,749	174,818	158,403	392,077	19,383	142,948	43,410	11,794	103,770	2,159,179
Excess	3,128	.....	6,535	.....	.....	2,504	1,426	5,669	16,717	.....	.....	.....
Per cent. of cars on line to total owned:												
Home	52	58	56	55	51	67	37	56	72	46	67	58
Foreign	52	40	47	42	42	34	71	48	91	37	30	41
All railways	104	98	103	97	93	101	108	104	163	83	97	99
Private cars on line	3,141	43,500	11,256	3,867	6,471	14,338	1,292	7,100	2,978	12,288	2,878	109,109
Total, all cars on line	81,977	742.338	240,005	178,685	164,874	406,415	20,675	150,048	46,388	130,235	106,648	2,268,288
Per cent. of cars in shop	4.36	5.43	6.70	6.34	7.00	6.42	5.70	6.92	4.65	4.51	6.32	5.91
No. of freight engines owned	1,110	10,420	2,949	3,052	2,554	6,369	495	2,759	730	2,609	2,151	35,198
Average cars on line per freight engine owned	74	71	81	59	65	64	42	54	64	50	50	64
Total freight-car mileage	43,298,113	526,805,172	146,207,679	126,173,907	125,600,367	255,069,990	21,443,085	90,009,322	33,212,009	112,491,827	76,424,963	1,556,736,434
Average miles per car per day	17.0	22.9	19.7	22.8	24.6	19.8	33.5	20.2	23.1	27.9	23.1	22.1
Per cent. loaded mileage	70.7	63.4	63.4	65.3	70.4	72.1	76.2	63.2	63.7	70.3	75.8	67.2
Ton-miles of freight, including company freight	464,943,851	8,045,561,169	1,972,280,000	1,995,098,453	1,866,182,090	2,378,165,679	367,873,357	1,268,525,151	393,732,201	1,638,614,587	1,045,199,339	21,436,175,877
Average ton-miles, including company freight:												
Per car-mile	10.7	15.3	14.1	15.8	15.0	14.2	18.0	14.1	11.9	14.7	13.7	14.7
Per loaded car-mile	15.2	24.1	21.6	24.2	18.9	20.7	23.6	20.7	17.9	20.9	18.0	21.9
Per car per day	183	351	282	360	368	302	633	285	274	409	316	331
Gross freight earnings	$5,258,727	$44,808,364	$11,325,579	$11,548,774	$12,100,886	$21,651,577	$2,493,140	$10,655,342	$3,339,458	$15,546,216	$6,619,227	$148,184,740
Average daily earnings: Per car owned	$2.24	$2.03	$1.64	$2.06	$2.30	$2.03	$4.60	$2.50	$4.04	$3.54	$2.01	$2.19
Per railroad car on line	2.15	2.07	1.60	2.13	2.46	2.02	4.31	2.40	2.48	4.25	2.06	2.21
All cars on line	2.07	1.95	1.52	2.08	2.37	1.94	4.03	2.23	2.32	3.85	2.00	2.10



Freight Car Earnings and Performance in 1907 to 1911 Inclusive.

was slightly better than for January, 1910, as indicated by the per mile of road revenue returns made to the Interstate Commerce Commission, the returns per car were somewhat lower. This is explained by the increase in equipment owned, which averaged 9.77 cars per mile of road in January, 1911, compared with 9.37 in January, 1910, an increase of 4.26 per cent., or substantially 100,000 cars. This increase, together with a difference in weather conditions, explains also the apparent discrepancy between the bi-weekly surplus reports, which show approximately 100,000 more idle cars in January, 1911, than in January, 1910, and the revenue returns made by the railways, which, as stated, show some increase over the previous year.

"Possibly the most striking feature of the car performance in January was the general homeward movement of cars, which increased the proportion of cars on home lines from 55 per cent. in December to 58 per cent. in January. To this movement is undoubtedly chargeable the large empty car mileage which decreased the loaded mileage ratio from 69.7 per cent. to 67.2 per cent.

"We have in previous bulletins called attention to the 'excess' empty mileage during certain portions of the year, and while there is nothing definite available or procurable showing just what the per cent. of necessary mileage is, there is little doubt a very large proportion of the empty mileage made during periods of light traffic would be found unnecessary if the traffic throughout the year were such as to create a steady demand for cars. It may be argued that this periodical empty movement is a natural adjustment of balance, and that a full traffic postpones but could not indefinitely prevent this large empty haul. While this is undoubtedly true as regards some individual roads, the general situation is such that a continued heavy traffic means a low per cent. of cars on their home lines with a high ratio of loaded mileage. As illustrative of this, attention is called to the charts accompanying this bulletin, with especial reference to the high loaded movement during August, September and October of the year 1907, the averages for these months running 70.8, 71.8 and 72.9 per cent., dropping to 70.2 in November when the traffic began to recede and to 64.6 in December, when the empty movement became a veritable rout.

"Those who recall the performance of December, 1907, and January and February, 1908, will not dispute the statement that the tactics pursued by a great many roads to decrease their car hire balance were utterly indefensible from the standpoint of the railway system of the continent as a whole. While the conditions at the present time are by no means as serious as were those existing in the winter of 1907-1908, there are indications of a return to some of the practices indulged in at that time, which emphasizes the need for some logical system that will reduce this wasteful movement to the minimum."

The accompanying table gives figures for car balance and performance in January and the charts show certain averages in 1907 to 1911, inclusive:

Conditions in the South.

President W. W. Finley, who has recently returned from an inspection trip of the Southern Railway, says that the agricultural outlook throughout the entire southeast seems to be very favorable. While in some localities in the southwestern part of the territory rains have somewhat retarded cotton planting, and while re-planting will be necessary in some small areas, it will have to be done to a very much smaller extent than was necessary last year. Notwithstanding the increased attention being given by Southern farmers to corn and other crops, the aggregate acreage devoted to cotton will be somewhat greater this year than last. Farmers are using fertilizers more scientifically and better farming is being practiced very generally throughout the south. Conditions in the cotton manufacturing industry are not wholly favorable. The lumber business is still feeling the effects of restricted purchases on the part of the railways, but a slight improvement is noticeable in some of the lumber producing localities.

The Southern Railway's present carrying capacity is comfortably ahead of its present requirements. The carryying capacity of those parts of its lines where the traffic is not sufficiently heavy to require double tracking is being increased by the construction of a modern system of lap-siding. The management now contemplates increasing its main-line double-trackage at a point where the volume of traffic is heavy and expects to be able to keep fully abreast of traffic requirements without going beyond or straining its present financial resources.

Crop Conditions.

The crop reporting board of the department of agriculture estimates that on May 1 the area of winter wheat to be harvested was about 31,367,000 acres, or 1,940,000 acres (6.6 per cent.) more than the area harvested in 1910, and 3,118,000 acres (9.0 per cent.) less than the area shown last fall (34,485,000) acres. The average condition of winter wheat on May 1 was 86.1, compared with 83.3 on April 1, 82.1 on May 1, 1910, and 86.0 the average for the past ten years on May 1.

The condition of the wheat crop on May 1 of the past five years averaged 85.7 per cent.; in the same five years the final yield per acre averaged 15.5 bushels; if the above ratio should prevail this year, the condition of 86.1 per cent. would indicate a yield of 15.6 bushels per acre, which compares with 15.8 bushels, the final estimate of yield per acre in 1910, 15.8 in 1909, and 15.5, the average of the past five years. On the estimated area to be harvested, 15.6 bushels per acre would produce 5.4 per cent. more than the final estimate of production last year, 9.6 per cent. more than the production of 1909, and 8.7 per cent. more than the average annual production of the past five years. The out-turn of the crop will probably be above or below the figures above, according as the change in conditions from May 1 to harvest is above or below the average change in the past five years.

The average condition of rye on May 1 was 90.0, compared with 89.3 on April 1, 91.3 on May 1, 1910, and 89.7 the average for the past ten years on May 1. Details for winter wheat follow:

	Winter Wheat.				
	Per Cent. Abandoned.	Acres Remaining to be Harvested.	Condition May 1,		
States.			1911.	1910.	10-Yr. Av.
Kansas	23.0	4,948,000	76	65	83
Indiana	3.4	2,698,000	90	82	84
Nebraska	6.5	2,665,000	88	67	89
Illinois	4.1	2,223,000	86	80	87
Missouri	2.5	2,195,000	92	73	88
Ohio	3.2	2,049,000	88	86	82
Pennsylvania	3.8	1,532,000	89	93	89
Texas	7.0	1,241.000	83	91	75
Oklahoma	32.0	1,123,000	67	87	84
Michigan	2.0	947,000	91	84	81
California	6.5	926,000	83	94	85
Tennessee	5.0	917,000	88	83	86
Virginia	2.9	796,000	89	92	89
Maryland	2.9	795,000	85	93	90
Kentucky	4.0	760,000	92	83	86
Washington	3.5	726,000	96	95	92
North Carolina	3.9	678,000	90	85	86
Oregon	4.0	530,000	94	95	95
South Carolina	3.4	494,000	85	81	85
New York	3.7	443,000	89	97	87
West Virginia	4.0	404,000	88	90	86
Idaho	3.7	377,000	96	98	95
Montana	5.5	366,000	98	98	..
Iowa	4.1	259,000	93	77	90
Georgia	3.3	258,000	91	83	87
Arkansas	5.0	213,000	88	92	86
Utah	6.0	164,000	92	94	..
Alabama	5.1	143,000	90	80	88
Colorado	11.5	121,000	85	94	..
Delaware	3.0	120,000	87	98	90
New Jersey	3.9	110,000	90	96	89
Wyoming	8.0	50,000	92	94	..
Wisconsin	6.8	71,000	88	92	89
Mississippi	12.5	9,000	85	87	87
Minnesota	...	.....	..	..	..
United States...	9.0	31,367,000	86.1	82.1	86.0

The average condition of meadow (hay) lands on May 1 was 84.7, compared with 89.8 on May 1, 1910, and a ten-year average on May 1 of 89.4.

Stocks of hay on farms May 1 is estimated as 7,546,000 tons (12.4 per cent. of crop) against 7,275,000 tons (11.2 per cent.) on May 1, 1910.

The average condition of pastures on May 1 was 81.3, compared with 89.3 on May 1, 1910, and a ten-year average on May 1 of 87.4.

Of spring plowing 71.0 per cent. was completed up to May 1, compared with 80.3 per cent. on May 1, 1910, and a ten-year average on May 1, of 67.2.

Of spring planting 60.0 per cent. was completed up to May 1, compared with 65.0 per cent. and 51.9 per cent. on May 1, 1910 and 1909, respectively.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF MARCH, 1911.

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or dec.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total, inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Atchison, Topeka & Santa Fe	7,550*	$5,083,291	$1,917,072	$7,876,706	$1,027,794	$1,301,514	$133,742	$2,291,438	$176,883	$4,931,371	$2,945,335	.....	$261,072	$2,684,263	$230,930
Atlantic Coast Line	4,495	2,304,616	768,046	3,290,556	341,810	373,488	44,750	1,007,139	68,329	1,835,516	1,455,040	.....	108,000	1,347,040	63,919
Boston & Maine	2,243	2,210,419	1,101,648	3,579,369	438,052	621,803	37,563	1,999,655	103,178	3,200,251	379,118	$7,079	185,291	200,906	—417,604
Central R. R. of New Jersey	631†	1,660,304	342,506	2,111,977	176,646	296,824	27,065	625,995	37,409	1,163,939	948,038	—12,756	94,427	840,855	119,961
Chicago & Eastern Illinois	966	738,360	160,541	956,926	84,920	159,009	22,018	373,249	33,506	672,702	284,224	—615	28,500	255,109	—144,252
Chicago & Northwestern	7,744‡	3,911,467	1,405,358	5,884,169	468,755	803,555	88,800	2,489,787	134,982	3,985,879	1,898,290	—11,632	260,000	1,626,658	—253,999
Chicago, Burlington & Quincy	9,091§	4,640,519	1,641,807	6,863,026	696,489	1,123,856	126,415	2,336,692	195,249	4,478,701	2,384,325	—12,589	249,854	2,121,882	—144,741
Chicago Great Western	1,496	786,550	206,962	1,070,865	92,854	157,650	45,303	451,413	35,859	783,079	287,786	—125	36,175	251,486	603
Chicago, Rock Island & Pacific	7,548¶	3,396,856	1,476,679	5,200,444	643,299	762,238	161,628	2,154,215	136,057	3,857,437	1,343,007	—5,448	206,692	1,130,867	334,131
Chicago, St. Paul, Minneapolis & Omaha	1,744	849,961	320,308	1,259,559	109,577	105,470	22,719	500,038	32,801	770,605	488,954	—2,021	64,422	422,511	—59,827
Cincinnati, Hamilton & Dayton	1,015‖	575,110	112,950	761,794	73,692	148,048	24,011	348,732	19,836	614,319	147,475	.....	32,028	115,447	—21,291
Delaware, Lackawanna & Western	930	2,058,139	572,776	2,808,183	189,544	495,142	59,558	921,875	60,958	1,727,077	1,081,106	12,219	138,028	955,297	—133,393
Denver & Rio Grande	2,545*a*	1,272,476	341,332	1,687,224	170,607	350,290	47,910	636,053	50,789	1,255,649	431,575	—4,641	73,000	353,934	—246,807
Erie	1,994*b*	3,020,380	664,338	3,968,120	304,859	645,593	87,017	1,422,303	104,524	2,564,296	1,403,824	—11,697	120,631	1,271,496	—210,210
Great Northern	7,327*c*	3,127,873	951,036	4,429,957	473,405	694,479	78,933	1,520,200	90,753	2,857,770	1,572,187	—396	255,021	1,316,770	—140,924
Gulf, Colorado & Santa Fe	1,518	588,046	217,015	872,718	185,409	153,973	27,522	413,981	32,936	813,821	58,897	.....	33,307	25,590	—49,013
Kansas City Southern	827	614,636	129,895	840,103	88,480	110,016	24,411	275,531	37,684	536,122	303,981	.....	27,399	276,582	8,888
Lake Shore & Michigan Southern	1,663	2,697,485	836,591	3,985,897	520,849	599,590	101,278	1,468,786	95,436	2,785,939	1,199,958	—6,477	135,000	1,058,481	—220,106
Lehigh Valley	1,433	2,665,556	287,395	3,045,616	234,425	515,304	76,036	997,007	65,033	1,887,805	1,157,811	—31,914	101,300	1,024,597	—81,843
Louisville & Nashville	4,591	3,639,748	952,077	4,874,674	773,654	791,935	93,246	1,527,769	86,519	3,273,123	1,601,551	7,639	150,000	1,459,190	—8,998
Maine Central	932	499,394	192,594	737,554	75,050	119,183	6,142	298,206	31,109	529,690	207,864	—1,015	41,311	165,538	—86,548
Michigan Central	1,805*d*	1,634,768	523,015	2,410,085	280,221	377,577	73,723	1,117,042	51,092	1,899,655	510,430	—3,616	110,000	396,814	—338,504
New York Central & Hudson River	3,591	4,936,382	2,227,097	8,159,297	972,486	1,517,015	172,154	3,308,992	229,036	6,199,683	1,959,614	15,100	376,783	1,597,931	774,850
New York, New Haven & Hartford	2,040	2,500,920	1,953,694	4,919,827	454,456	622,985	30,296	2,142,351	189,950	3,440,038	1,479,789	99,178	285,000	1,293,967	—186,396
Norfolk & Western	1,990*e*	2,482,104	310,239	2,885,340	339,162	470,126	48,567	886,311	60,012	1,804,178	1,081,162	—557	115,000	965,605	—296,355
Northern Pacific	6,028*f*	3,428,571	1,215,868	4,959,768	345,335	706,713	114,103	1,785,668	83,595	3,035,414	1,924,354	5,229	247,988	1,681,595	—19,336
Oregon Short Line	1,646*g*	1,020,219	325,169	1,449,709	175,618	181,452	24,782	398,594	40,949	821,395	628,314	—3,516	58,665	566,133	77,834
Oregon-Washington R. R. & Nav. Co	1,737*h*	808,179	347,241	1,231,171	157,539	136,906	45,581	491,440	39,843	871,309	359,862	—14,522	74,169	271,171	—
Pennsylvania *Co.*	1,416	2,790,681	609,158	3,747,977	417,157	658,979	69,640	1,431,999	82,402	2,660,177	1,087,800	—8,183	265,367	814,250	—123,015
Pennsylvania *R. R.*	3,977*i*	9,693,390	2,537,832	12,999,491	1,453,119	2,304,021	166,668	4,911,992	360,847	9,196,647	3,802,844	—120,394	531,228	3,151,222	—554,871
Pere Marquette	2,334	929,270	276,555	1,304,040	147,425	219,798	37,241	638,178	46,676	1,089,318	214,722	—8,608	54,635	151,479	—256,236
Philadelphia, Baltimore & Washington	713	775,113	586,427	1,506,887	203,077	234,214	30,333	682,645	52,742	1,203,012	303,875	.....	47,396	256,479	—40,746
Pittsburgh, Cincinnati, Chic. & St. Louis	1,467	2,106,877	623,108	3,061,569	298,170	581,020	63,038	1,189,961	64,802	2,196,991	864,578	—1,056	134,245	729,277	—147,501
Southern Railway	7,038	3,722,150	1,221,013	5,349,517	635,498	860,261	124,156	1,865,218	150,022	3,635,155	1,714,362	—6,605	184,437	1,523,320	42,117
Union Pacific	3,473*j*	2,505,489	761,241	3,641,199	462,657	474,191	96,499	1,043,954	101,196	2,178,497	1,462,702	—6,393	152,686	1,303,623	—296,064
Vandalia	827	571,625	182,352	847,799	99,433	156,989	23,704	342,668	19,665	642,459	205,340	.....	27,441	177,899	—4,898

NINE MONTHS OF FISCAL YEAR 1911.

Atchison, Topeka & Santa Fe	7,550*	$44,506,105	$17,143,576	$67,248,639	$9,641,216	$10,496,956	$1,322,761	$19,660,074	$1,414,200	$42,535,207	$24,713,432	.....	$2,200,817	$22,512,615	$2,150,526
Atlantic Coast Line	4,495	16,314,405	5,878,019	23,866,570	3,021,694	3,488,175	408,985	7,735,742	615,268	15,269,864	8,596,706	.....	879,000	7,717,706	51,815
Boston & Maine	2,243	19,277,011	11,771,054	33,567,578	4,286,807	4,566,880	374,542	15,981,908	820,770	26,030,907	7,536,671	$42,420	1,623,172	5,955,919	—1,824,796
Central R. R. of New Jersey	631†	13,667,131	3,531,086	18,136,426	1,849,335	2,783,533	279,907	5,316,240	357,219	10,586,234	7,550,192	66,418	814,260	6,802,350	—290,585
Chicago & Eastern Illinois	966	7,342,466	1,614,937	9,538,721	902,355	1,642,036	212,433	3,506,679	298,680	6,562,183	2,976,538	—11,549	252,629	2,712,360	—71,496
Chicago & Northwestern	7,744‡	37,398,920	14,581,916	57,042,005	7,217,944	7,059,745	948,819	23,678,745	1,231,254	40,136,507	16,905,498	—28,570	2,382,000	14,494,928	19,413
Chicago, Burlington & Quincy	9,091§	44,752,074	17,400,869	67,904,905	8,357,694	11,040,187	1,195,008	22,069,057	1,685,936	44,347,882	23,557,023	—78,150	2,244,527	21,234,346	2,962,320
Chicago Great Western	1,496	6,689,298	2,156,557	9,562,967	1,031,317	1,441,590	418,283	3,880,388	320,382	7,091,960	2,471,007	1,722	298,756	2,173,973	—
Chicago, Rock Island & Pacific	7,548¶	31,704,215	14,819,129	49,442,736	6,970,040	6,793,785	1,421,863	19,073,545	1,248,315	35,507,548	13,935,188	—89,111	1,981,046	11,865,031	814,281
Chicago, St. Paul, Minneapolis & Omaha	1,744	8,273,200	3,473,563	12,557,625	1,327,885	1,431,809	209,553	4,787,819	269,497	8,026,563	4,531,062	—12,559	538,032	3,980,471	442,471
Cincinnati, Hamilton & Dayton	1,015‖	5,166,074	1,274,713	7,172,894	581,767	1,277,638	218,159	3,308,946	195,029	5,581,539	1,591,355	.....	275,744	1,315,611	—140,124
Delaware, Lackawanna & Western	930	19,361,283	5,669,878	26,698,292	2,771,699	3,915,992	533,405	8,133,825	535,070	15,889,991	10,808,301	173,299	1,221,108	9,760,492	—1,840,243
Denver & Rio Grande	2,545*a*	13,131,327	3,884,446	17,797,063	2,019,601	3,135,671	430,181	6,151,296	445,799	12,182,548	5,614,515	—27,124	639,000	4,948,391	—79,962
Erie	1,994*b*	26,924,676	6,845,016	36,421,214	4,060,623	6,127,711	880,068	12,125,061	737,776	23,931,239	12,489,975	—202,902	1,051,465	11,235,608	246,168
Great Northern	7,327*c*	32,779,600	9,981,965	46,111,370	6,160,161	5,865,878	752,312	13,766,476	862,118	27,406,945	18,704,425	132,310	2,412,016	16,424,719	—1,322,523
Gulf, Colorado & Santa Fe	1,518	6,542,628	2,373,881	9,550,783	1,692,514	1,424,365	222,390	3,691,053	291,938	7,322,260	2,228,523	.....	296,959	1,931,564	285,834
Kansas City Southern	827	5,666,295	1,258,141	7,714,695	778,604	1,006,732	238,515	2,595,890	280,895	4,900,636	2,814,059	.....	258,040	2,556,019	366,577
Lake Shore & Michigan Southern	1,663	23,911,758	8,613,309	36,824,211	5,862,335	5,781,907	900,725	13,224,448	712,660	26,482,075	10,342,136	—47,446	1,315,182	8,979,508	—3,762,038
Lehigh Valley	1,433	22,982,021	3,364,566	27,292,745	2,712,867	4,650,712	736,783	8,968,471	581,972	17,650,805	9,641,940	—250,210	864,300	8,527,430	—845,827
Louisville & Nashville	4,591	30,153,833	8,864,188	41,479,864	6,720,218	7,159,672	860,118	13,289,386	809,583	28,838,977	12,640,887	18,717	1,276,800	11,382,804	—1,981,373
Maine Central	932	4,089,783	2,256,215	6,769,758	1,053,842	1,007,093	65,819	2,612,418	235,849	4,975,021	1,794,737	12,071	333,478	1,473,330	—518,453
Michigan Central	1,805*d*	14,612,664	5,709,970	22,667,738	3,244,679	3,309,328	680,930	9,574,494	444,675	17,254,106	5,413,632	—35,262	1,025,020	4,353,350	—1,934,125
New York Central & Hudson River	3,591	43,975,618	23,282,285	75,341,967	10,406,006	13,131,456	1,812,614	29,210,210	2,013,539	56,573,825	18,768,142	60,716	3,553,452	15,275,406	—2,481,894
New York, New Haven & Hartford	2,040	22,439,550	19,660,384	46,245,543	5,045,975	5,393,837	259,174	18,441,769	1,363,600	30,504,355	15,741,188	1,053,586	2,747,000	14,047,774	—525,991
Norfolk & Western	1,990*e*	22,714,300	3,188,986	26,874,080	3,090,210	4,995,679	443,644	8,083,563	546,115	17,159,211	9,714,869	—6,766	975,000	8,733,103	—1,106,974
Northern Pacific	6,028*f*	33,265,901	13,233,963	49,751,768	5,853,990	6,075,361	813,642	16,604,234	764,811	30,112,038	19,639,730	392,521	2,453,681	17,578,570	—2,064,993
Oregon Short Line	1,646*g*	10,766,245	3,668,131	15,407,144	1,959,935	1,670,436	254,029	3,791,660	388,638	8,064,698	7,342,446	—15,482	626,761	6,700,203	—1,157,604
Oregon-Washington R. R. & Nav. Co	1,737*h*	2,481,104	1,098,719	3,826,207	487,337	424,504	141,949	1,589,561	144,944	2,788,295	1,037,912	—31,591	240,820	765,501	—
Pennsylvania *Co.*	1,416	29,237,416	6,315,121	38,774,175	4,588,019	6,803,453	718,369	13,982,507	760,080	26,852,428	11,921,747	—54,503	1,697,691	10,169,553	—2,709,860
Pennsylvania *R. R.*	3,977*i*	85,666,638	25,016,747	118,454,191	14,728,341	22,338,129	1,702,177	43,985,801	3,045,974	85,800,423	32,653,768	—977,384	4,099,759	27,576,625	—6,868,120
Pere Marquette	2,334	8,145,743	3,030,931	12,120,306	1,572,412	1,887,774	353,465	5,530,090	312,910	9,656,651	2,463,655	—59,879	522,922	1,880,854	—1,288,675
Philadelphia, Baltimore & Washington	713	7,106,318	5,716,918	14,231,885	2,138,535	2,298,005	263,377	6,011,183	335,559	11,046,659	3,185,226	.....	435,629	2,749,597	—152,249
Pittsburgh, Cincinnati, Chic. & St. Louis	1,467	20,342,845	6,183,595	29,793,194	3,655,346	5,573,914	663,851	11,326,576	591,347	21,811,034	7,982,160	—7,989	1,231,771	6,742,400	—1,939,851
Southern Railway	7,038	30,393,156	12,237,485	46,101,598	5,725,698	7,427,138	1,160,117	15,509,298	1,330,823	31,153,074	14,948,524	3,294	1,640,339	13,311,479	437,904
Union Pacific	3,473*j*	27,825,237	8,405,737	39,557,506	3,884,778	4,604,029	909,858	10,277,682	963,409	20,639,755	18,917,750	46,545	1,396,381	17,474,824	—1,343,884
Vandalia	827	5,423,146	1,840,053	8,076,385	1,028,880	1,479,588	249,351	3,239,936	177,785	6,175,540	1,900,845	.....	250,492	1,650,353	—130,101

Mileage operated on March 31, 1910—* 7,459 miles; † 668 miles; ‡ 7,638 miles; § 9,021 miles; ¶ 7,393 miles; ‖ 1,036 miles; *a* 2,506 miles; *b* 1,961 miles; *c* 7,129 miles; *d* 1,746 miles; *e* 1,951 miles; *f* 5,849 miles; *g* 1,509 miles; *i* 3,947 miles; *j* 3,411 miles.

h Began operations on December 24, 1910.

When the State Was a Common Carrier.

Now let me quote as a matter of history what I think is a precious morsel. Here is the report of the public authorities in charge of the Public Works of Pennsylvania to the Legislature in 1857. They complained that competition from local works compelled them to make material reduction in tolls. Mark you, they had no trains and locomotives; they only charged for the road, the public had to provide the locomotives and cars. It was only a toll road and the tolls they charged were much higher than the transportation charges of today. They go on to say, "This depreciation in revenues from the low rate charged by competing railroads must cease at no distant day. These companies have begun to open their eyes to the fact that mere tonnage or travel alone do not constitute profit upon the capital invested, and that rates which they have a few years past imposed upon the carrying trade have been below a remunerative standard. The result of this conclusion must be that they will be compelled to fix their tolls upon such a basis as to yield bona fide dividends to stockholders commensurate with the capital invested, and to abandon the existing suicidal system of enticing trade to their respective improvements by a sacrifice of capital, and increase of debt, with a total disregard of the interests of those stockholders who have invested their funds under the promise and expectation of deriving at least the usual interest therefrom. When this policy is adopted, as it must be shortly, there can be no fear but that the works owned by the Commonwealth will continue to receive their fair share of the carrying trade, and that no diminution of her revenue from this source need be anticipated." Think of a government pleading for a higher rate of transportation, in the light of our experience within the last few months!—*George F. Baer,* before the Traffic Club of Pittsburgh.

Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railways of the American Railways Association in presenting statistical bulletin No. 93-A, giving a summary of car shortages and surpluses by groups from December 10, 1909, to April 26, 1911, says:

"The decrease in coal car surplus continues, the accumulation having been reduced by 8,605 cars during the two weeks since our last bulletin. There were increases in box and miscellaneous cars of 7,513 and 3,638 respectively, making a net increase of 2,305 in the surplus of all classes, with totals 189,524.

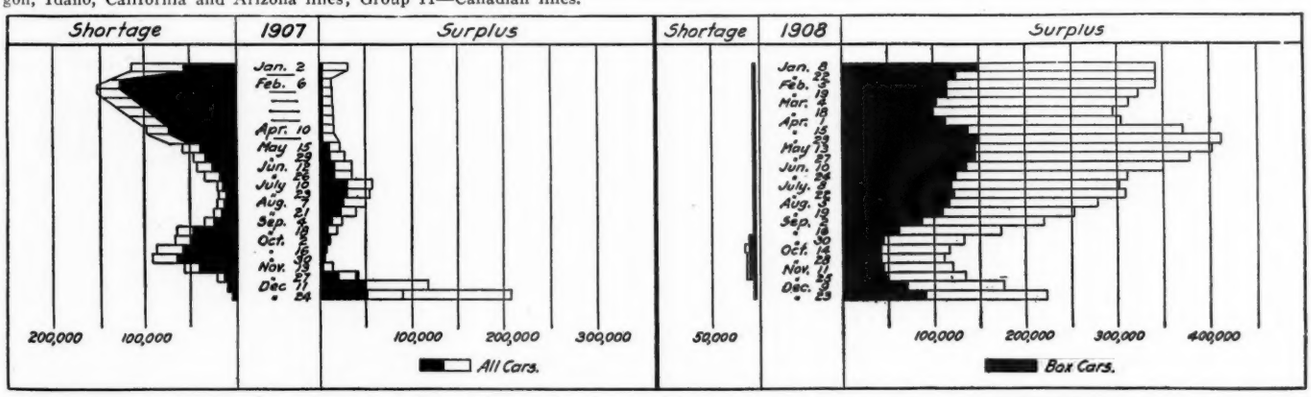
"The increase in box cars is general, with the exception of groups 6 (Northwestern), and 7 (Montana, Wyoming, etc.), where slight decreases are reported. The miscellaneous cars for which increases are shown are chiefly stock cars. The decrease in coal car surplus is principally in group 3 (central) where the lake coal traffic is heaviest."

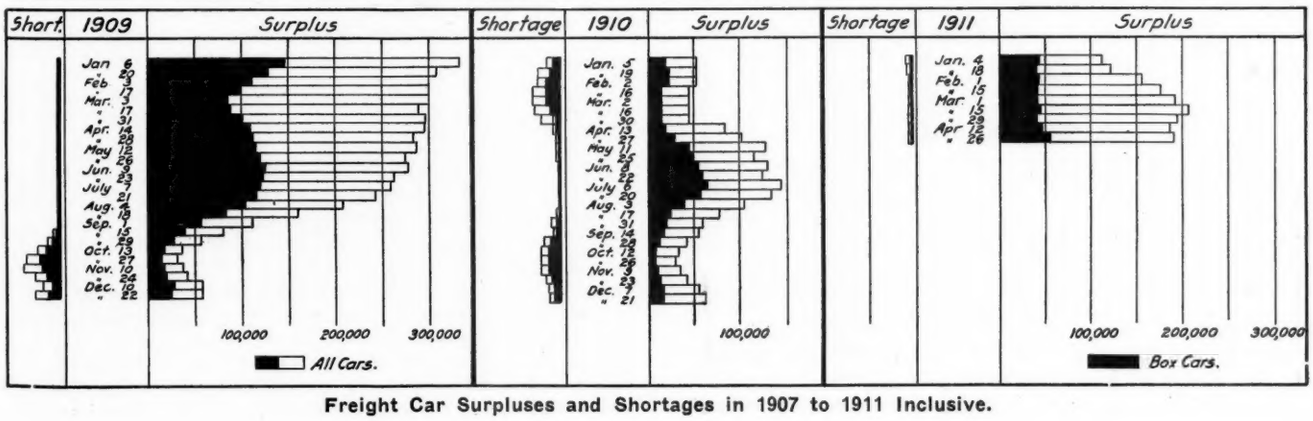
The accompanying table gives surpluses and shortages by groups for the past period covered by the report, and the charts show bi-weekly totals for 1907 to 1911, inclusive.

CAR SURPLUSES AND SHORTAGES.

Date.	No. of roads.	Surpluses: Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Shortages: Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
Group *1.—April 26, 1911	8	1,454	1,307	431	224	3,416	0	76	0	4	80
" 2.— " 26, 1911	24	3,682	171	24,606	8,574	37,033	0	0	0	0	0
" 3.— " 26, 1911	25	7,660	1,454	38,089	4,510	51,713	0	0	2,000	62	2,062
" 4.— " 26, 1911	10	3,350	143	6,183	2,102	11,778	6	51	0	0	57
" 5.— " 26, 1911	19	6,007	946	6,097	1,935	14,985	0	40	0	0	41
" 6.— " 26, 1911	26	9,265	1,183	3,583	6,558	20,589	70	13	3	0	86
" 7.— " 26, 1911	4	1,332	260	820	311	2,723	0	0	0	0	0
" 8.— " 26, 1911	16	9,057	553	2,979	3,718	16,307	5	0	0	0	5
" 9.— " 26, 1911	11	3,036	557	337	1,473	5,403	10	0	0	0	10
" 10.— " 26, 1911	20	7,102	2,335	2,206	9,153	20,796	0	2	0	12	14
" 11.— " 26, 1911	5	3,107	664	20	990	4,781	0	138	0	25	163
Total	168	55,052	9,573	85,351	39,548	189,524	91	320	2,003	104	2,518

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland, and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia, and Florida lines; Group 6—Iowa, Illinois, Wisconsin, Minnesota and the Dakotas lines; Group 7—Montana, Wyoming and Nebraska lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Oregon, Idaho, California and Arizona lines; Group 11—Canadian lines.





Freight Car Surpluses and Shortages in 1907 to 1911 Inclusive.

INTERSTATE COMMERCE COMMISSION.

The commission has changed from May 15 to June 15 the date for compliance with its order forbidding a railway to fix the rate for the transportation of any commodity according to the purpose for which the commodity is to be used.

The commission has granted the request of the Carolina, Clinchfield & Ohio to carry coal from points in Virginia to Charleston, S. C., for a lower rate than is charged to certain intermediate points. This is the first order of the kind which has been issued by the commission since the change in the law made last year. Similar permission has been granted in regard to the Pere Marquette in regard to coal shipped from Black Rock and Suspension Bridge, N. Y., to Milwaukee and other points in Wisconsin.

The commission has issued a revised order relative to irregularity in dating bills of lading, dealing with certain practices whch have been found to exist on cotton carrying roads of the South. Bills of lading must not be issued until the cotton has been actually received by the carrier; delivery to a compress cannot be deemed a delivery to the railway. The question whether some compresses may be practically the same as railway stations is not decided. Where a switching line delivers a car to a line carrier, the latter must date the bill of lading the day when it receives the goods; not the day on which they are delivered to the switching road. But if the switching ticket shows consignee and destination and is, in effect, an informal bill of lading, issued by the initial carrier, there is no objection to issuing a formal bill of lading bearing the same date as the switching ticket. Bills of lading must not show a false point of origin. Where this has been done shippers have been able to commit frauds on consignees. Where a bill of lading is issued in exchange for another bill of lading or a receipt the fact must be plainly stated.

Reparation Awarded.

Joseph Peters v. Oregon Short Line et al. Opinion by the Commission:

A rule in the tariff providing that shipments of coal should not be weighed except at point of origin found unreasonable. Charges assessed for the transportation of coal from Diamondville, Wyo., to Anaconda, Mont., found to have been unreasonable because assessed on overweight. (20 I. C. C. 598.)

E. Sondheimer Company v. Illinois Central et al. Opinion by Commissioner McChord.

The original report in this case (17 I. C. C., 60), disposed of all question at issue, except the claim for reparation, the case being held open to permit the complainant to prove the extent of the damages sustained by undue preference of Memphis over Cairo. The undisputed evidence is that during the time Cairo was subject to undue prejudice on shipments of lumber, complainant was forced to reduce its profits on lumber from Cairo by an amount equal to the advantages in freight rates enjoyed by Memphis dealers. The defendants say that no legal basis for reparation has been established because the damages sought by complainant are speculative. They say that it is impossible for complainant to tell to what extent, if any, prices on lumber in a large consuming market such as Chicago are controlled by Memphis prices. The commission finds that the proper measure of the damages to complainant is the difference between the old and new Memphis tariffs, and therefore awards $8,827 to complainant. (20 I. C. C., 606.)

Reparation Denied.

Freeman Lumber Co. v. St. Louis, Iron Mountain & Southern et al. Opinion by Commissioner Clark:

The commission repeats that reparation will not ordinarily be awarded in a formal case attacking a rate as unreasonable, or otherwise in violation of law, unless intent to claim reparation is specifically disclosed therein or in an amendment thereof filed before the submission of the case, adhered to. (20 I. C. C. 612.)

Sweeney, Lynes & Co. v. New York, Philadelphia & Norfolk et al. Opinion by Chairman Clements:

Defendants' rates for refrigeration of strawberries from Norfolk, Va., and Only, and Pittsville, Md., and Marion, found to be unreasonable, and maximum rates prescribed for future. (20 I. C. C. 600.)

Complaint Dismissed.

Bookwalter Wheel Co. v. Tennessee Central et al. Opinion by Commissioner Meyer:

Claim for reparation based on alleged misrouting of shipment from Fourteen Mile Switch, Tenn., to Miamisburg, Ohio, denied. (20 I. C. C. 603.)

Proposed Hearings and Suspensions of Tariffs.

The commission has suspended until September 4, certain tariffs on ice presented by the Chicago, Milwaukee & St. Paul, which were to have gone into effect May 7. The commission has suspended until October 26 certain tariffs on milk presented by the Baltimore & Ohio Southwestern, which were to have gone into effect June 28.

Definition of "Completely K. D."

Pacific Coast Biscuit Co. v. Spokane, Portland & Seattle, et al. Opinion by the commission.

Western classification provides that first-class rates shall be charged on peanut roasters completely K. D. The complainant shipped various kinds of peanut roasters and these machines were taken apart, in so far as it was possible to do so, without injury to the machine. The commission finds that the terms in the western classification are misleading, since some types of roasters merely had the wheels, axles and springs removed from the body, but was rated as completely knocked down, while others having glass cases were not rated as completely knocked down because the glass had not been taken out and packed flat, but this could not have been done without destroying parts of the frame. A refund is ordered, and the commission assumes that the defendants will amend their classification to make definite provision for application of the various rates. (20 I. C. C., 546.)

Rates on Beer into a Prohibition State.

W. J. Scheuing v. Louisville & Nashville. Opinion by the commission.

The defendant is a dealer in soda water and tobacco at Cullman, Ala., and claims that the Louisville & Nashville charged an unreasonable rate on shipments aggregating 74,000 lbs. of bottled beer. The defendant said that there had been almost no movement of beer in carload quantities from St. Louis to Cullman, and that therefore no commodity rate had been established. At the hearing the railway laid great stress on the Alabama statute, which prohibits the sale of beer within the state. Great anxiety was also manifested lest the commission, by reducing the rate to Cullman, might aid and abet a violation of this statute. It doubtless overlooked the fact that a similar construction might be placed on its own action, giving favorable rates to Decatur, Ala., and Birmingham, Ala. However, a shipper is entitled to have his interstate freight moved at reasonable rates. To regulate these rates is the commission's function; to enforce state laws, the duty of the state. Reparation is awarded. (20 I. C. C., 550.)

STATE COMMISSIONS.

The Railroad Commission of Georgia is making an extended and detailed inquiry into the business of the Southern Express Company, which operates on most of the lines of that state.

An interesting contest has been going on before the Railroad Commission of Washington over the adjustment of freight rates as between competing communities in that state. Tacoma and Seattle, which are on the Pacific coast, have petitioned the commission to require substantial reductions in the rates east bound from these cities. Spokane is opposing the reductions asked for as vigorously as it has demanded reductions in its rates from the eastern part of the United States. The state commission finds itself between the two fires of these jealous competing communities just as the railways have been in past years, and the indications are that it will find it as impossible

as the railways have to satisfy both sides. The rate expert of the commission, O. O. Calderhead, testified regarding the value of the different roads involved in the state of Washington, his testimony being based on the valuation made about two years ago by the state commission. The railways, on the other hand, have introduced testimony of their own officers regarding the value of their properties, and the indications are that the case may ultimately result in a test of the validity of the commission's valuation, similar to the test of the Minnesota Commission's valuation in the Minnesota rate case. The Washington valuation is the most important that has been made by any public authority, except that in Minnesota; and the commission has already made some reductions in rates, particularly on grain, which have been based on its valuation. A legal test of the Washington valuation would be of special interest because, while the Minnesota valuation was based entirely on the cost of reproduction of the physical properties, the Washington commission attempted to take into consideration all the elements that enter into the value of the railways as going concerns and to ascertain their market values.

COURT NEWS.

In the federal court at Tulsa, Okla., April 26, the Kansas City Southern was acquitted of the charge of violating the 16-hour law as applied to the working hours of freight trainmen.

The Court of Appeals of Georgia in the case of *Perry v. Atlantic Coast Line,* has sustained the right of the road to require the coupons of mileage books to be exchanged for tickets before asking for transportation on a train. Perry boarded a train at night where there was no ticket seller and paid to the first station where there was an office open; but he did not get off there and provide himself with a ticket for the remainder of his journey, and so when he presented his mileage a second time the conductor put him off the train. There being no state law or rule regulating mileage books, the buyer, says the court, must accept the conditions prescribed by the road in selling him the book.

The Supreme Court of Montana, in the case of Doherty, has sustained the Pullman Company in a rule not to sell seat tickets in sleeping cars between the hours of 10 p. m. and 7 a. m. A party of five men boarded a train one morning about six o'clock; and there being no day cars on the train, applied for accommodations in a sleeping car. Four of the men bought two berths for $3, making the rate 75 cents for each man, but the fifth had to take a whole berth or nothing. Rather than pay $1.50 he allowed the conductor to put him off the train, and he waited for the second section of the train, 40 minutes later. Associate Justice Smith, while concurring in the action of the court on the ground that the plaintiff had magnified a small matter into a law suit, holds that by making such a rigid rule the Pullman Company practices discrimination. The Justice advises the company to exercise a little common sense in such matters.

Judge Sanborn at St. Paul, Minn., has refused the petition to grant a stay of execution of the court's recent order pending the appeal which he allowed the state to make to the United States Supreme Court, although he extended until July 1 the time when the Great Northern, the Northern Pacific and the Minneapolis & St. Louis are required to restore the rates in effect prior to September 6, 1906, that is, the 3-cent passenger fares and the merchandise freight rates that are 20 to 25 per cent. higher than the rates ordered by the state railway commission on that date. The injunction, which would have expired June 1, was extended a month in order that the roads might revise their tariffs and give the Interstate Commerce Commission the necessary 30 days' notice of the changes. While the case tried by Judge Sanborn affected only the three roads above mentioned, it is expected that the court will grant injunctions to the stockholders of the Chicago, Rock Island & Pacific, the Minneapolis, St. Paul & Sault Ste. Marie, the Chicago, Great Western, the Chicago, Burlington & Quincy, the Chicago, Milwaukee & St. Paul and the Chicago, St. Paul, Minneapolis, & Omaha, compelling them to establish the higher rates previously in effect on the ground that the rates established by the state commission interfere with interstate traffic.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

C. S. Clarke, first vice-president of the Missouri Pacific, with office at St. Louis, Mo., has resigned.

J. H. Steele has been elected president of the Texas City Steamship Company, with office at Galveston, Texas.

D. B. Pankey, treasurer of the St. Louis, Kennett & Southeastern, has been elected president, succeeding R. H. Jones, deceased. L. R. Jones succeeds Mr. Pankey, and A. E. Diamant has been appointed secretary, succeeding J. B. Blakemore, all with offices at Kennett, Mo.

T. J. Freeman, receiver and general manager of the International & Great Northern, at Houston, Tex., has been elected first vice-president in charge of operation and a member of the board of the Texas & Pacific. Plans are under way for the eventual consolidation of the operating management of the Texas & Pacific and the International & Great Northern in charge of Mr. Freeman, following the reorganization of the latter company, subsequent to the foreclosure sale on May 16.

Benjamin Thomas Wood, whose appointment as assistant to the vice-president of the St. Louis & San Francisco, the Chicago & Eastern Illinois and the Evansville & Terre Haute, with office at St. Louis, Mo., has been announced in these columns, was born December 31, 1878, at Springfield, Mo. He received a high school education, graduating in 1896, and in 1897 began railway work with the Kansas City, Fort Scott & Memphis as a stenographer in the division superintendent's office. In January, 1899, he became secretary to the general superintendent, and three years later went with the St. Louis & San Francisco as secretary to the vice-president and general manager, where he remained for two years. He was then made secretary to the third vice-president of the Rock Island Lines and afterwards became secretary to the president. He was appointed chief clerk to the president of the Rock Island in January, 1905, and in December, 1909, when the Rock Island-Frisco merger was dissolved, he was made chief clerk to the president of the Chicago & Eastern Illinois, which position he held until his recent appointment as assistant to the vice-president of the Frisco Lines.

B. T. Wood.

Operating Officers.

W. D. Forster, traffic manager of the Tonopah & Goldfield, at Goldfield, Nev., has been appointed also superintendent, succeeding A. B. Phillips.

P. C. Connelly, division roadmaster of the Great Northern, at Spokane, Wash., has been appointed a trainmaster, with office at Grand Forks, N. Dak.

F. S. James has been appointed superintendent of the Missouri, Kansas & Texas of Texas, with office at Greenville, Texas, succeeding W. J. Stoneburner, resigned to go to another company.

F. A. Lattig, superintendent of the National Lines of Mexico at Monterey, Mex., has been appointed superintendent of the Missouri, Kansas & Texas of Texas, with office at Smithville, Tex., succeeding W. Rudd, resigned.

W. J. Stoneburner, whose appointment as general manager of the Texas City Terminal Company, with office at Texas City, Texas, has been announced in these columns, has been appointed also general manager of the Texas City Transportation Company.

J. P. Quigley has been appointed car accountant of the Western Pacific and the Boca & Loyalton, also superintendent of telegraph of the Western Pacific and the Western Union Telegraph Company, with office at San Francisco, Cal., succeeding E. W. Mason.

H. D. Earl, assistant superintendent of the St. Louis Southwestern of Texas at Tyler, Texas, has been appointed superintendent, with office at Mt. Pleasant, Texas, succeeding W. N. Neff, promoted. R. L. Garner, chief despatcher at Mt. Pleasant, succeeds Mr. Earl.

G. H. Alexander, car accountant of the New York Central & Hudson River, at New York, has been appointed superintendent of car service, in direct charge of the freight car distribution and tracing of freight, also the car records, car demurrage, mileage, per diem accounts and such other duties as may be assigned to him, with office at New York.

T. Collins, assistant superintendent of the Canadian Pacific, at Smiths Falls, Ont., has been appointed assistant superintendent of District No. 2, Eastern division, with office at Smiths Falls. W. B. Way, assistant superintendent on the Lake Superior division, at Chapleau, has been appointed assistant superintendent of District No. 3, Eastern division, with office at Montreal, Que., and J. H. Boyle, assistant superintendent at Montreal, has been appointed assistant superintendent of District No. 4, with office at Ottawa, Ont.

A. C. Kellar has been appointed superintendent of the Sierra Railway of California, with office at Jamestown, Cal. Mr. Kellar was born September 24, 1869, at Memphis, Tenn., and was educated in the private schools of his native town and at Western Kentucky College, South Carrollton, Ky. He entered the service of the Louisville & Nashville in 1895, as agent and operator, and in 1897 was promoted to despatcher. He left that company in 1898, since which time he has held various positions on the Missouri Pacific, Union Pacific, Atchison, Topeka & Santa Fe, Northern Pacific and Chicago & North Western.

Frank Cizek, who has been appointed superintendent of the Syracuse and Utica divisions of the Delaware, Lackawanna & Western, with office at Syracuse, N. Y., as previously announced in these columns, was born April 2, 1875. He was educated in the common schools at Chicago, and in 1889, began railway work as a messenger in the office of the Chicago, Rock Island & Pacific, at Chicago. In 1891 he was transferred to the office of the general passenger agent, and the following year was made a ticket soliciting clerk. He was appointed clerk and messenger in President R. R. Cable's office in 1893. From 1895 to 1899, he was stenographer and secretary to W. H. Truesdale, vice-president and general manager of the Rock Island, and when Mr. Truesdale was elected president of the Delaware, Lackawanna & Western in March, 1899, came east in the same capacity. In 1901 Mr. Cizek entered the operating department as chief clerk to trainmaster at Hoboken, N. J., and two years later was appointed assistant trainmaster, becoming passenger trainmaster in 1907. He was promoted to superintendent of the Bangor & Portland division in May, 1908, at Easton, Pa., which position he held at the time of his recent appointment as superintendent of the Syracuse and Utica divisions.

Frank Cizek.

John H. Keefe, whose appointment as assistant general manager of the Gulf, Colorado & Santa Fe, with office at Galveston, Texas, has been announced in these columns, was born August 20, 1880, at Raub, Benton county, Indiana. He was educated at St. Mary's University, and began railway work in November, 1896, with the Colorado & Santa Fe part of the Santa Fe system, as an office boy and messenger in the office of the superintendent of transportation. He held several different clerical positions, and in August, 1902, was appointed chief clerk to the general superintendent. Three years later he was made assistant to the general manager, which position he held continuously until his appointment as above, his title recently having been assistant to the second vice-president and general manager.

Traffic Officers.

W. E. Zirckel has been appointed general agent of the Denver & Rio Grande, with office at Cleveland, Ohio.

W. R. Haughawout has been appointed a traveling freight agent of the St. Louis & San Francisco, with office at Oklahoma City, Okla.

E. S. Vincent has been appointed traveling freight and passenger agent of the Southern Pacific, with office at Little Rock, Ark., a new agency.

W. J. Foley has been appointed traveling freight and passenger agent of the Denver & Rio Grande and the Western Pacific, with office at St. Louis, Mo.

Harry C. Strohm, ticket clerk of the Baltimore & Ohio, at Youngstown, Ohio, has been appointed a traveling passenger agent, with office at Chicago.

L. J. Hausman has been appointed traveling freight agent of the Chicago, Rock Island & Gulf, with office at San Antonio, Tex., succeeding J. I. Johnson, promoted.

Frank C. L. Lathrop, commercial agent of the Southern Pacific, at Pasadena, Cal., has been appointed district passenger agent, with office at Los Angeles, succeeding N. R. Martin.

J. W. Byars, commercial agent of the International & Great Northern at Waco, Texas, has been appointed commercial agent, with office at Dallas, Texas, succeeding E. A. Turner.

H. Y. Williams, traveling passenger agent of the Gulf, Colorado & Santa Fe, at Temple, Tex., has been appointed colonization agent, with office at Galveston, succeeding S. A. Kendig, deceased.

W. O. Skinner, commercial agent of the Atchison, Topeka & Santa Fe at Pueblo, Colo., has been appointed a division freight agent, with office at Pueblo, a new office, and his former position has been abolished.

W. E. Zirckel, traveling freight agent of the Western Pacific, at Pittsburgh, Pa., has been appointed general agent, Cleveland district, of the Western Pacific and the Denver & Rio Grande, with office at Cleveland, Ohio.

Alan W. Graves has been appointed commercial agent of the Atlantic Coast Line, with office at Baltimore, Md., succeeding J. B. Andrews. J. G. North has been appointed soliciting agent at Macon, Ga., succeeding J. W. White, and W. W. Lawton has been appointed a special agent at Havana, Cuba.

C. E. Dewey, general freight agent of the Central Vermont, has been appointed general freight agent of the Grand Trunk Pacific, in charge of the territory from Port Arthur, Ont., west, also general freight agent of the Grand Trunk Pacific Coast Steamship Company, Ltd., with office at Winnipeg, Man.

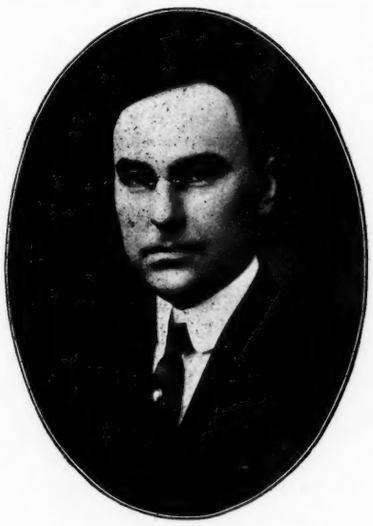
J. McArthur has been appointed agent of the Grand Trunk Pacific, with office at Victoria, B. C., succeeding H. Brown. W. J. Quinlan, traveling passenger agent at Winnipeg, Man., has been appointed district passenger agent, with office at Winnipeg, succeeding A. E. Duff, and H. J. Lambkin succeeds Mr. Quinlan.

F. W. Hopper, traveling passenger agent of the Grand Trunk at Detroit, Mich., has been appointed a general agent, with office at San Francisco, Cal. C. A. Schmidt, soliciting freight agent

at St. Louis, Mo., has been appointed a traveling freight agent, with office at St. Louis, succeeding F. A. Crow, resigned, and W. T. Page succeeds Mr. Schmidt.

P. F. Finnegan, chief clerk in the general freight department of the Baltimore & Ohio at Chicago, has been appointed general freight and passenger agent of the Baltimore & Ohio Chicago Terminal, with office at Chicago. Mr. Finnegan was born in Chicago, November 4, 1877, and he received a high school education in that city. He began railway work in May, 1895, in the transportation department of the Baltimore & Ohio, where he remained for over five years. He was transferred to the freight traffic department as claim and rate clerk in October, 1900, and since September, 1905, has been chief clerk in the general freight department.

V. D. Fort, who has been appointed to the new office of assistant freight traffic manager of the Illinois Central, with office at Chicago, as was previously announced in these columns, was born January 29, 1870, at Cedar Rapids, Iowa. After receiving a common school education he began railway work at Cedar Rapids in 1885, with the Burlington, Cedar Rapids & Northern, now part of the Rock Island Lines. He was for a time clerk in the general freight department, and for four years from 1888, was chief tariff clerk for the Chicago Great Western. He then went to the Illinois Central in the same capacity and was afterwards promoted to chief clerk in the general freight department. For eight years from October, 1901, he was assistant general freight agent, becoming general freight agent in the latter part of 1909, from which office he is now promoted to assistant freight traffic manager.



V. D. Fort.

Donald Rose, who has been promoted from freight traffic manager of the Illinois Central and the Indianapolis Southern at Chicago to European traffic manager, with office at London, with jurisdiction over those lines and the Yazoo & Mississippi Valley, the Central of Georgia and the Ocean Steamship Company of Savannah, was born in Scotland and came to Canada when a boy. He began railway work in the traffic department of the Grand Trunk at Montreal, Can., and later was connected with the traffic department of the Chicago, Rock Island & Pacific and the Atchison, Topeka & Santa Fe. Since 1892 he has been with the Illinois Central. He began in the freight traffic department, and was for a time commercial agent at Salt Lake City, Utah. He was appointed assistant to J. T. Harahan, then second vice-president, in 1901, and in 1904 was sent to London to represent the company, where he remained for five years. In February, 1909, he was appointed assistant to the president at Chicago, and in September of the same year was promoted to freight traffic manager, which office he resigns to accept the appointment as above.

Donald Rose.

W. B. McGroarty, district freight agent of the Southern Railway, at Jacksonville, Fla., has been appointed agent of the Piedmont Air Line, with office at Baltimore, Md., succeeding G. R. Needham, resigned to go into other business. C. M. Tyler, traveling freight agent of the Southern Railway, at Tampa, Fla., succeeds Mr. McGroarty; H. F. Phipps, soliciting agent, at Tampa, succeeds Mr. Tyler; Robert B. McGroarty succeeds Mr. Phipps, and R. N. Beason has been appointed a soliciting agent, at Huntsville, Ala.

Joseph Hattendorf, whose appointment as general freight agent of the Illinois Central, with office at Memphis, Tenn., has been announced in these columns, was born January 13, 1875, at Arkadelphia, Ark. He was educated in the public schools of Memphis and began railway work in April, 1892, as messenger boy for the Louisville, New Orleans & Texas and the Newport News & Mississippi Valley, now part of the Illinois Central system. He was made chief clerk in the general freight office in January, 1903, and three years later was promoted to assistant general freight agent at Memphis. In January, 1910, he was transferred with the same title to Chicago, which office he now leaves to return to Memphis as general freight agent.

Engineering and Rolling Stock Officers.

T. Kilpatrick has been appointed general foreman at the Cedar Rapids (Iowa) shops of the Rock Island Lines, succeeding J. M. Whalen, resigned.

J. H. Conlen, division roadmaster of the Great Northern at Whitefish, Mont., has been appointed roadmaster at Spokane, Wash., succeeding P. C. Connelly, transferred to the operating department.

S. H. Draper, general air brake inspector of the Northern Pacific at St. Paul, Minn., has been appointed master mechanic of the Rocky Mountain division, with office at Missoula, Mont., succeeding Silas Zwight, promoted.

The office of supervisor of timber preservation on the Rock Island Lines has been abolished, and C. F. Ford has been appointed supervisor of the tie and timber department, with office at Chicago. Mr. Ford will have charge of timber preservation, succeeding Dr. Hermann Von Schrenk, assigned to special work.

Incident to the dividing of the Iowa division of the Chicago & North Western into the East Iowa division and the West Iowa division, W. H. Bradley, formerly master mechanic of the Iowa division at Clinton, Iowa, has been appointed master mechanic of the East Iowa division, with office at Clinton, and J. E. Osmer, assistant master mechanic at Boone, Iowa, has been appointed master mechanic of the West Iowa division, with office at Boone.

Charles Scott, general foreman of the Buffalo, Rochester & Pittsburgh, has been appointed supervisor of bridges and buildings, for Divisions 1 and 2, with office at East Salamanca, N. Y., succeeding J. C. Rouse, master carpenter, retired under the pension rules. E. W. Fair, master carpenter, at Du Bois, Pa., has been appointed supervisor of bridges and buildings, for Divisions 3, 4 and 5 of the Erie division, with office at Du Bois, and the title of master carpenter has been abolished.

George E. Cessford, whose appointment as district master mechanic of the Chicago, Milwaukee & Puget Sound has been announced in these columns, was born September 22, 1858, at Clarence, Iowa. He received a grammar school education and began railway work on June 1, 1876, with the Chicago, Milwaukee & St. Paul. He was a machinist in the locomotive shop first at Milwaukee, Wis., and then at Minneapolis, Minn., and was roundhouse foreman for a number of years, filling that position at Calmar, Iowa; Mitchell, S. D.; Plummer, Idaho; Seattle, Wash., and Tacoma, Wash. He was then promoted to general foreman at Tacoma, from which position he was recently advanced to district master mechanic of the Chicago, Milwaukee & Puget Sound, with office at Miles City, Mont.

Howard M. Curry, whose appointment as mechanical superintendent of the Northern Pacific has been announced in these

columns, was born January 6, 1861, in Ogle county, Illinois. He received a common school education at Freeport, Ill., and began railway work in 1880 with the Northern Pacific. From June 12 of that year he was consecutively fireman, road engineer, assistant road foreman east of Mandan, and in December, 1898, was promoted to road foreman east of Mandan. Three years later he was appointed master mechanic at Fargo, N. D., and was transferred to Staples, Minn., in December, 1902. He was appointed general master mechanic over the territory east of Billings, Mont., in February, 1905, and in January, 1908, his jurisdiction was extended over the Yellowstone, Montana and Rock Mountain divisions which latter office he resigned on May 1 to become mechanical superintendent, with office at St. Paul, Minn.

OBITUARY.

E. B. Pope, western passenger agent of the Chesapeake & Ohio, at St. Louis, Mo., died at that place on May 7.

S. M. Bamberger, vice-president of the Salt Lake & Ogden, at Salt Lake City, Utah, died at Baltimore, Md., on May 9.

A. S. Buford, formerly president of the Richmond & Danville, now a part of the Southern Railway, died May 6, at his home in Richmond, Va.

W. B. Jennings, traveling freight and passenger agent of the Wabash, with office at Moberly, Mo., died at Rochester, Minn., on May 1. Mr. Jennings had been with the Wabash 40 years.

Joseph L. Doherty, auditor of the Chicago, Indianapolis & Louisville, with office at Chicago, died at Chicago on May 5. Mr. Doherty was 48 years old and had been with the Monon about 25 years, having been auditor for the last ten years.

Johnston Livingston, president of the National Express Co., died at his home in New York, May 7, at the age of 95 years. At the time of his death Mr. Livingston was also a director of the American Express Company.

William M. Burgard, formerly general agent of the Chicago & North Western, at Buffalo, N. Y., died May 7, at Mount Clemens, Mich. Mr. Burgard had been in railway service for about 25 years, and for most of that time was with the Chicago & North Western.

Charles G. Clark, vice-president of the American Express Company, died May 6, at his home in Englewood, N. J., at the age of 85 years. Mr. Clark was treasurer from 1885 to 1902, when he was elected vice-president, and at the time of his death he was also a member of the board and of the executive committee.

James M. McKinlay, assistant secretary, with office at New York, of the Chicago, Milwaukee & St. Paul for forty-two years, died Wednesday at his home. He was born and educated in Dunfermline, Scotland, came to America in 1847 and went to Dubuque, where he was admitted to the bar, and acted as attorney for the Dubuque & Sioux City, now part of the Illinois Central. He came to New York in 1868 to go into the service of the St. Paul. He retired from active service only last year.

FOREIGN RAILWAY NOTES.

The government of Ecuador has recently spent $50,000 for repairs on the roadbed of the Machala to Puerto Bolivar Railway. This short line is in the southern part of Ecuador and is of particular importance, as it affords a safe and quick outlet to the Pacific ocean for the products of the fertile country through which it passes.

An imperial edict, issued in Peking, China, May 9, authorizes the conclusion of the loan of $30,000,000 for railway construction in Central China. The loan was signed a year ago, despite provincial opposition by groups of financiers representing the United States, France, Great Britain and Germany. The amount of the loan remains at $30,000,000, notwithstanding the elimination of a branch section of the railway and the four groups of bankers will participate.

Railway Construction.

New Incorporations, Surveys, Etc.

Alabama, Tennessee & Northern.—This road has been extended from Geiger, Ala., south to York, 28 miles.

Angelina & Neches River.—According to press reports, this company, which operates a 20-mile line from Keltys, Texas, east to Naclina, is making plans to build an extension northeast to Chireno, about 15 miles.

Atchison, Topeka & Santa Fe.—Track laying has been finished, it is said, on the section of the Texico-Coleman cut-off between Sweetwater, Texas, and a point on the Lubbock division. It is understood that this new line will be put in operation this month. From Sweetwater, south to Coleman, the line has been finished for some months and is open for traffic. There remains about 100 miles of work yet to be finished to complete the cut-off; this work is now in progress on the last division between Lubbock and Texico.

An officer writes that double-tracking work has been finished on the lines between Chicago and Kansas City, Mo., except on 35 miles between Carrollton, Mo., and Rothville, on which grading is about finished and track laying and ballasting should be completed within the next 90 days. There is 3.5 miles between Carrollton Junction and Floyd on the east bank of the Missouri river which the company will probably not undertake this year, or not until a new bridge over the Missouri river between Floyd and Sibley has been built, but the company has not yet determined whether this bridge is to be a single or double-track structure. When the work between Camden Junction and Floyd is finished the company will have double-track from Chicago through to Kansas City, except for bridges over the Illinois, Mississippi, Des Moines and Missouri rivers.

Atlantic Coast Line.—This company is said to have bought 50 acres of land east of Augusta, Ga., to be used as a site for a freight yard.

Baltimore & Ohio.—An officer writes that satisfactory progress is being made on the improvements being carried out near Tunnelton, W. Va. The heading of the 4,700 ft. tunnel through the Allegheny mountains has been partly bored out, and it will be put in operation at an early date. Bennett & Talbott, Fairmont, are the contractors. (August 26, p. 372.)

Canadian Northern.—An officer is quoted as saying that contracts were let last year for work on 140 miles of main line and bids are now being asked for constructing an additional 200 miles, chiefly rock work through British Columbia, on the Pacific coast section coming eastward. Rails are already on the way to be laid on this section. From the eastern end the main line is built west into the foot hills beyond Edmonton, Alb.

Canadian Northern Ontario.—The Dominion parliament, it is said, has extended the time in which to build various lines already authorized, including one from Berlin, Ont., east via Guelph, Acton and Brompton to Toronto. The railway commissioners are said to have approved revised location plans for a line from near Billings Bridge, on the Toronto-Ottawa line, and have under consideration plans for the route at Smiths Falls. All the right-of-way between Ottawa and Smiths Falls has been secured and most of the right-of-way for the line between Smiths Falls and Sydenham. It is expected that contracts will be let soon to build from Ottawa to Sydenham. Between Toronto and Sydenham work is well advanced, and it is expected that this section will be finished this coming fall. (March 10, p. 478.)

Canadian Northern Quebec.—The Dominion parliament, it is said, has authorized this company to build from Rawdon, Que., to a junction with the Grand Trunk Pacific, with a branch from near Rawdon to Joliette, also a line from St. Jerome to St. Eustasche.

Cary North & South.—An officer writes that grading contracts will be let about July 1, to build from Cary, Ga., north via Danville to Gordon, and to build south from Cary via Cochran to Hawkinsville, in all about 50 miles. Surveys are now being made and most of the right-of-way has been secured. The company expects to have all the grading finished by Oc-

tober of this year. Maximum grades will be 1 per cent. and maximum curvature 5 deg. The line is being built to carry lumber, wood pulp, cotton and agricultural products. H. R. Brown, president, and D. B. Dunn, chief engineer, Macon.

Cherryvale, Oklahoma & Texas.—An officer writes that work is now under way by the Continental Construction Company, Caney, Kan., from Caney, southeast via Wann, Okla., Delaware, Nowata and Vinita to Siloam Springs, Ark. and grading has been finished on 25 miles. Maximum grades will be 1 per cent. and maximum curvature 6 deg. There will be one steel bridge, 160 ft. long, and a 75-ft. girder bridge. S. M. Porter, president, Caney, and B. J. Dalton, chief engineer, Lawrence. (December 2, p. 1096.)

Copper River & Northwestern.—This road has been extended from Chitina, Alaska, east to Kennecott, 66 miles.

Crystal City & Uvalde.—According to press reports, construction work is to be started soon on an extension from Gardendale, Texas, to Dulls, about 25 miles.

Grand Trunk.—The board of railway commissioners has under consideration plans for the elevation of the Grand Trunk's tracks from Bonaventure station, Montreal, Que., to St. Henri.

An officer of the Grand Trunk is quoted as saying that plans are being made to spend from $8,000,000 to $9,000,000 in double-tracking the lines in Toronto and vicinity.

Governor Pothier of Rhode Island has signed a bill which provides for access by the Grand Trunk to the proposed docks at Providence, R. I. This is to be accomplished by building a line over and under the tracks of the New York, New Haven & Hartford. The bill has been mutually agreed upon by Grand Trunk and New Haven interests. It is expected that the Southern New England, under whose charter the Grand Trunk will build, will immediately begin construction work on the line from Palmer, Mass., where connection is to be made with the Central Vermont, another Grand Trunk subsidiary, to the Providence waterfront. By the terms of the agreement with the New Haven, the latter company will pay the cost of constructing a tunnel under its tracks. At another point there will be a grade crossing. (April 28, p. 1016.)

Iowa Traction Company.—An officer writes that grading has been finished on 20 miles of the line under construction from Oskaloosa, Iowa, north via Barnes City, Montezuma, Malcom, Tama, Toledo, Traer and Eagle Center to Waterloo, about 100 miles. It is expected to let some additional contracts in about 30 days. There will be two steel bridges, and 3,000 ft. of trestles. A power plant is included in the plans. G. E. Wodehouse, president, and J. C. Lathrop, chief engineer, Oskaloosa. (November 11, p. 945.)

Levisa Railroad.—An officer writes that it has not yet been decided to build the line projected from Ward, Pike county, Ky., on the Chesapeake & Ohio, up Levisa river to Grundy, Va., 50 miles. The Chesapeake & Ohio is said to be back of this project. G. B. Wall, president, and H. Pierce, engineer of construction, Richmond.

Methow Valley & Washington Northern.—An officer writes that arrangements are being made to begin construction work soon on the line from Winthrop, Wash., along the west bank of Methow river via Twisp, to Carleton, thence along the east side of the river to Methow, again returning to the west side of the river to a point near Pateros, thence along the east side of the river to Pateros, on the Columbia river, 43 miles. Most of the right-of-way has been secured. Under the terms of the charter the company can build from Puget Sound to Spokane. J. C. Barton, vice-president and chief engineer, Twisp. (May 5, p. 1085.)

New Orleans, Mobile & Chicago.—An officer writes regarding the reports that the company contemplates building an extension from some point in southern Mississippi to New Orleans, La., that this is a future plan of the company, but nothing is being done at present on the extension. (April 14, p. 925.)

New York, New Haven & Hartford.—The detailed plans for the improvement of the Air Line division through Middletown, Conn., between New Haven and Willimantic, as filed with the state railway commissioners, show that the work to be carried out will cost over $1,000,000. This is in addition to the cost of the railway bridge, which was recently finished over the Connecticut river between Middletown and Portland.

North Coast.—See Oregon-Washington Railroad & Navigation Company.

Oregon Trunk Line.—This road has been extended from Metolius, Ore., south to Opal City, 11.7 miles. It is expected that the remaining section under construction south to Bend, 30 miles, will be opened this coming summer.

Oregon-Washington Railroad & Navigation Company.—Work is nearing completion on the line from Maegley Junction, Ore., east to Troutdale, and it is expected to have the line in operation by June 1. (December 16, p. 1167.)

An order has recently been given for rails, switches, frogs, tie plates, etc., to finish the section of the North Coast from Spokane, Wash., to Ayer Junction, about 103.4 miles. Delivery is to begin in about three months. It is understood that the work on this section is to be pushed to completion.

This company will build a branch, it is said, from the main line at a point on the Des Chutes river to Ashwood, Ore., about 20 miles.

Pecos Valley Southern.—This company is said to be making plans to build an extension from Balmorhea, Texas, south via Fort Davis to Alpine, about 60 miles. The line may eventually be extended further south to a point on the Rio Grande border, an additional 100 miles from Alpine. (January 27, p. 184.)

Quebec, Central.—The Chaudiere Valley division has been extended from St. Justine, Que., to St. Sabine, three miles.

San Pedro, Los Angeles & Salt Lake.—An officer writes that contracts have been let to the Utah Construction Company, Ogden, Utah, to build from Moapa, Nev., southeasterly, following the Moapa valley to St. Thomas. The work will be generally light valley work. There will be one mile of medium heavy mountain work.

Skaneateles Railroad.—An officer of this company, which operates a five-mile line from Skaneateles Junction, N. Y., where connection is made with the New York Central & Hudson River, to Skaneateles, five miles, writes that the company plans to replace the present tracks with 80-lb. rail to carry the heavy rolling stock and increased traffic. Preliminary surveys are being made for an extension north via Elbridge to Jordan, five miles, and it is expected that work will be started soon on the first section to Elbridge.

Southern New England.—See Grand Trunk.

St. Louis Southwestern.—According to press reports, this company will let contracts soon for building a line from Stephenville, Texas, to the Thurber coal fields, about 30 miles. (April 14, p. 912.)

Tuckahoe & James River.—An officer writes that contracts will be let this month to build a line to carry coal from the Carbon Hill mine of the Old Dominion Development Company in Henrico county, Va., to the Richmond, Fredericksburg & Potomac, near Laurel, nine miles. There will also be one mile of sidings. Location work has been finished. William G. Woolfolk, president, Lorraine. E. W. Hastings, of the Richmond, Fredericksburg & Potomac, Richmond, is temporary chief engineer.

Union Pacific.—According to press reports, this company will build an extension of the line now in operation to Callaway, Neb., northwest of that place.

United Railways (Electric).—This road has been extended from North Plains, Ore., to Banks, 3.6 miles.

Vallejo & Northern (Electric).—This company, which was organized to build from Vallejo, Cal., northeast to Woodland, thence southeast to Sacramento, about 70 miles, is said to have started construction work between Vallejo and Suisun.

Wichita Falls Route.—According to press reports, a contract has been given by the Wichita Falls & Southern to build an extension from Newcastle, Tex., southeast to Graham, about 15 miles.

Wichita Falls & Southern.—See Wichita Falls Route.

Railway Financial News.

Atchison, Topeka & Santa Fe.—The Paris Bourse has listed $10,000,000 common stock of the Atchison, Topeka & Santa Fe on the Parquet. This listing was carried through by private bankers, of course with the consent of the directors of the railway company. Its object is to give the Atchison a broader market in France in which to do any future financing. On June 30, 1910, there was $165,518,500 common stock outstanding, and presumably this has been increased since by the conversion of bonds.

Belt Railroad & Stock Yards (Indianapolis, Ind.).—Estabrook & Co., Boston, Mass., are offering the unsold portion of $1,000,000 first refunding mortgage 4 per cent. bonds of 1909-1939 at 97½, yielding 4.15 per cent. interest on the investment. These bonds are to retire an equal amount of 6 per cent. bonds matured April 30, 1911. When the mortgage securing the 6 per cent. bonds is cancelled the bonds now offered will be secured by a first lien on 39.17 miles of single track and about 150 acres of stock yards.

Birmingham & Southeastern.—This is the new name of the Union Springs & Northern, which operates a line from Union Springs, Ala., to Fort Davis, 7½ miles, and is building an extension from Fort Davis to Millstone, about 20 miles.

Boston & Maine.—A quarterly dividend of 1 per cent. has been declared on the common stock, thus reducing the annual rate from 6 per cent. to 4 per cent. In 1909 the dividend was reduced from 7 per cent. to 6 per cent. The company had been paying 7 per cent. since 1900. Control of the Boston & Maine is held by the Boston Railroad Holding Company, all of whose stock is owned by the New York, New Haven & Hartford.

Canadian Northern.—G. P. Graham, minister of railways of Canada, has given notice of a resolution to be introduced by the government in the Canadian parliament embodying a bill providing for the guarantee of bonds of the Canadian Northern at the rate of $35,000 a mile.

Canadian Pacific.—H. S. Holt, president of the Montreal Light, Heat & Power Company, has been elected a director of the Canadian Pacific.

Central of Georgia.—The income bondholders' protective committee has refused to accept as full payment the compromise offer of the directors of the company to make part payments on the dividends for 1908, 1909 and 1910 on the three classes of income bonds. This offer of the directors was to pay the full 5 per cent. interest on the first income bonds for 1908, and about 2.82 per cent. on the second income bonds; and to pay about 2.31 per cent. on the first income bonds for 1909 and 1910. "In order to end vexatious litigation" holders of the Central of Georgia income bonds offered them to Illinois Central banking interests at 112½ for the first income bonds, 106¼ for the second income bonds and 102½ for the third income bonds, which prices include 17½ per cent. of "overdue" interest on all classes of bonds. The offer was made on condition that the bankers would bear a part of the legal expenses of the bondholders, who have been suing for a long time in the courts to compel payment of interest on their bonds. The bankers were willing to accept the income bonds at the prices named, but refused to bear any part of the legal expenses.

Chesapeake & Ohio.—See Hocking Valley.

Chicago, Milwaukee & Puget Sound.—It is understood that this company is to issue to the C. M. & St. P., $25,000,000 additional first mortgage 4 per cent. bonds in repayment for advances. On June 30, 1910, there was outstanding $123,000,000 Puget Sound bonds, all in the treasury of the St. Paul. Since then over $7,000,000 have been issued to the St. Paul, and the St. Paul has sold $25,000,000 out of its treasury. The St. Paul owns the entire $100,000,000 capital stock of the Puget Sound.

Chicago, Milwaukee & St. Paul.—See Chicago, Milwaukee & Puget Sound.

Denver, Northwestern & Pacific.—The interest due May 1 on the $4,000,000 6 per cent. two-year notes of the Colorado-Utah Construction Company, which are secured by the deposit of $8,000,000 Denver, Northwestern & Pacific bonds, was paid, but the principal of the notes, which was also due May 1, was not paid pending the determination of the best way to refund these securities. The notes bear the personal guarantee of David H. Moffatt, who until his recent death was president of the railway company.

Detroit, Toledo & Ironton.—On application of the trustee of the general lien and divisional mortgage bonds and the trustee of the consolidated mortgage bonds, the United States District Court at Detroit has signed a decree of foreclosure, fixing $2,500,000 as the upset price.

Fort Dodge, Des Moines & Southern.—Judge McPherson has authorized the receivers' to issue $500,000 receivers' certificates to pay for improvements, including additional yards at Fort Dodge, additional passing tracks, preliminary experiments in the introduction of automatic block signals, repairs to bridges on main line, etc.

Hocking Valley.—The injunction suit brought to prevent the Chesapeake & Ohio from voting its majority common stock of the Hocking Valley has at last come to trial in the federal court. Ralph Westfall, attorney for one of the plaintiffs, testified that he had bought Hocking Valley, Chesapeake & Ohio, Lake Shore & Michigan Southern, Minneapolis & St. Louis and Kanawha & Michigan stocks for the purpose of continuing the litigation.

Indianapolis Southern.—This property was sold under foreclosure for $2,500,000 to representatives of the Illinois Central.

Kansas City Southern.—Samuel McRoberts, vice-president of the National City Bank, New York; E. F. Swinney, president of the First National Bank of Kansas City, New York, and Arthur Turnbull, New York, have been elected directors, succeeding George Craig, Port Arthur, Texas; Adolphus Busch, St. Louis, Mo., and D. G. Boissevain, New York.

Louisville & Nashville.—J. P. Morgan & Co., New York, have arranged to sell for the company $10,000,000 Knoxville & Northern division mortgage 4 per cent. bonds of the Louisville & Nashville. It is understood that public offerings are to be made at 93¼.

Missouri, Kansas & Texas Railway.—The company has made application to the Texas railway commission for a certificate permitting the issue of $107,000,000 consolidated mortgage bonds. The application requested advance authority of the commission to issue consolidated mortgage bonds from time to time as needed for the purpose specified in the mortgage. The commissioners declined to approve the application as presented, on the ground that, in their opinion, it was not sufficiently explicit as to the purposes for which the bonds would be issued, or their proceeds used. It is probable that the application will be amended to the satisfaction of the commission.

New York, New Haven & Hartford.—See Boston & Maine.

Union Springs & Northern.—See Birmingham & Southeastern.

Vandalia.—The directors have declared a quarterly dividend of 1 per cent. payable May 25, a reduction of ¼ of 1 per cent. quarterly, thus placing the stock on a 4 per cent. annual basis as compared with the former 5 per cent. rate.

In the calendar year 1910 the Vandalia earned a surplus over charges of $645,753. The dividend of 5 per cent. on $14,606,400, which was paid last year, required $730,320 a year, so that last year's dividend was paid partly from profit and loss surplus.

Western Pacific.—The construction account of this company is to be closed on June 30. Since the issue of first mortgage bonds on September 1, 1905, interest has been charged to construction account, as has also operating expenses of the road since the line has been opened for traffic. Revenue derived from traffic has been credited to this account. Up to June 30 the Western Pacific will have charged to construction account about $14,500,000 for interest on its first mortgage bonds, so that it is estimated that the road had put into it about $34,000,000 from the sale of $50,000,000 first mortgage bonds.

Supply Trade Section.

C. Henze has been appointed resident manager at Chicago of the Federal Signal Company, Albany, N. Y.

The Central Locomotive & Car Works, Chicago, has filed certificate of incorporation in Augusta, Maine, with $500,000 preferred stock and $100,000 common stock.

L. A. Irwin, formerly purchasing agent of the Quincy, Omaha & Kansas City, is now with the Western Railway Supply Company, Kansas City, Mo.

The U. S. Metal & Manufacturing Company, New York, has opened a branch office in the Morris building, Philadelphia, Pa., to take the place of the office at Lebanon, which has been closed. The new office will be in charge of L. Weimer Murray.

Dr. Charles H. Dressel, vice-president of the Dressel Railway Lamp Works, New York, died at his home in New York, April 25. Mr. Dressel was one of the pioneers in the railway lamp business. He was a member of the Railway Signal Association.

The David Lupton's Sons Company, Philadelphia, Pa., has opened an office in the Oliver building, Pittsburgh, Pa. Walter C. Scott, civil engineer, has resigned his position with the National Tube Company, Pittsburgh, Pa., to take charge of this new office.

The American Electric Railway Manufacturers' Association has secured the use of Young's Million Dollar Pier, Atlantic City, N. J., for its exhibition in connection with the convention of the American Electric Railway Association, to be held October 9-13. Details concerning exhibits, hotels, railway facilities, etc., may be obtained from George Keegan, secretary, 165 Broadway, New York.

Alva A. Griner, western manager of the Dahlstrom Metallic Door Company, Jamestown, N. Y., has been put in charge of this company's New York office, A. T. Hansen taking his place as manager of the Chicago office. This company has opened new offices in Cleveland, Ohio, Detroit, Mich., and Pittsburgh, Pa. W. D. Callinan is in charge of the Cleveland office, in the Garfield building. S. C. Malmberg is in charge of the Detroit office, in the Ford building, and L. H. Gibson is in charge of the Pittsburgh office in the Henry W. Oliver building.

W. M. White, formerly with the I. P. Morris Company, Philadelphia, Pa., has been made manager and chief engineer of the hydraulic turbine department of the Allis-Chalmers Company, Milwaukee, Wis. While in charge of designing for the I. P. Morris Company, Mr. White designed some of the largest installations in the country, including such plants as the Toronto Power Company, Niagara Falls, N. Y.; the Washington Water Power Company, Spokane, Wash.; and the Shawinigan Falls Power Company, Montreal, Que. Mr. White is an active member of the American Society of Mechanical Engineers.

The General Electric Company, Schenectady, N. Y., has received an order for equipment for the Portland, Gray & Lewiston Railway. This road is now under construction and will run from Portland, Mo., to Lewiston. Curves have been eliminated wherever possible. For its entire length of 30 miles, with the exception of about one-half mile, the road is located on private right-of-way. There is but one grade as steep as 4 per cent., this being 4.2 per cent. The sharpest curve is 8 deg. Power will be bought from a private company. The order includes three sub-station equipments, each consisting of a 300 k. w. rotary converter, transformers and switchboard. The equipment for a general utility car which will be used in construction work is included in the order.

The United States Steel Corporation reports unfilled tonnage orders 3,218,704 tons on April 30. This compares with unfilled orders of 3,447,301 tons on March 31, 1911; 3,400,543 tons on February 28, 1911; 3,110,919 tons on January 31, 1911; 2,674,757 tons on December 31, 1910; 2,760,413 tons on November 30, 1910; 2,871,949 on October 31, 1910; and 5,402,514 on March 31, 1910. The showing in unfilled tonnage in the month of April was not as favorable as expected, as estimates placed the shrinkage between 150,000 and 200,000 tons. Evidently, shipments in April were a great deal larger than anticipated by the trade. Based upon new orders received, the Steel Corporation shipped an average of 34,100 tons a day, or 885,250 tons for the month, a figure in excess of March shipments. The following table gives unfilled tonnage over a period of years:

Period.	Unfilled Tonnage.	Period.	Unfilled Tonnage.
Apr. 30, 1911	3,218,704	Dec. 31, 1908	3,603,527
Mch. 31, 1911	3,447,301	Sept. 30, 1908	3,421,977
Feb. 28, 1911	3,400,543	June 30, 1908	3,313,876
Jan. 31, 1911	3,110,919	Mch. 31, 1908	3,765,343
Dec. 31, 1910	2,674,757	Dec. 31, 1907	4,642,553
Nov. 30, 1910	2,760,413	Sept. 30, 1907	6,425,008
Oct. 31, 1910	2,871,949	June 30, 1907	7,603,873
Sept. 30, 1910	3,158,106	Mch. 31, 1907	8,043,858
Aug. 31, 1910	3,537,128	Dec. 31, 1906	8,489,718
July 31, 1910	3,970,931	Sept. 30, 1906	7,936,884
June 30, 1910	4,257,794	June 30, 1906	6,809,584
Mch. 31, 1910	5,402,514	Mch. 31, 1906	7,018,712
Dec. 31, 1909	5,927,031	Dec. 31, 1905	7,605,086
Sept. 30, 1909	4,796,833	Sept. 30, 1905	5,865,377
June 30, 1909	4,057,939	June 30, 1905	4,829,655
Mch. 31, 1909	3,542,595	Mch. 31, 1905	5,579,560

John F. Wallace, chairman of the board of directors of Westinghouse, Church, Kerr & Company, New York, has been made president of this company, succeeding H. H. Westinghouse. As other work requires all of Mr. Westinghouse's time, he recommended that Mr. Wallace assume the active management of the company. Mr. Wallace's career is familiar to the reader, but his more recent positions may be mentioned. After leaving the chief engineership of the Panama canal, he acted as confidential consulting engineer for the Chicago & North Western in the general design of the new passenger terminal for that company in Chicago. He then took the office he has held until his present change. Mr. Wallace is also president of the Electric Properties Company, New York, which controls Westinghouse, Church, Kerr & Company. Among the directors elected at the annual meeting of Westinghouse, Church, Kerr & Company are N. W. Halsey and F. Q. Brown of New York; George Westinghouse and J. R. McGinley of Pittsburgh, Pa., and Homer Loring of Boston, Mass.

John F. Wallace.

The Allith Manufacturing Company, Chicago, and the T. C. Prouty Company, Ltd., Albion, Mich., announce the consolidation of the business of these two companies to be carried on under the name Allith-Prouty Company. At present the two plants are being operated independently, but it is expected that in the near future the Chicago plant will be moved to Albion and that the complete line will be handled from a general office located there. The Allith company has made a specialty of round track door hangers and particularly heavy sliding-door hardware, while the Prouty concern has specialized more particularly on lighter sliding door hangers and track devices, and has also carried a considerable line of hinges and light finishing hardware. The consolidation of these two lines will not make it necessary to discontinue making any of the Allith products and only a few of those of the Prouty company. The sales

force of both companies will be retained by the consolidated company and, in fact, this force will be enlarged to enable them to cover the field more completely.

TRADE PUBLICATIONS.

Long Island Railroad. This company has issued a booklet entitled Long Island Resorts, describing the many attractive points along its line. The booklet is fully illustrated and gives information on the distances, accommodations and pastimes of these resorts.

Draft Rigging. The T. H. Symington Company, Baltimore, Md., has published a small illustrated booklet on Farlow draft rigging entitled Two Yokes in Transportation. This booklet enumerates concisely thirty Farlow facts, pointing out the advantages of this product. Diagrams are included.

The Detroit & Mackinac. The passenger department of this company has issued a well illustrated booklet containing about 100 pages, entitled Health and Pleasure Resorts on the Detroit & Mackinac Railway. The booklet includes brief descriptions of the many attractions of the various resorts along the lines of this road.

Electric Motors. The Crocker-Wheeler Company, Ampere, N. J., has devoted bulletin No. 129 to direct current crane and hoist motors; and bulletin No. 132 to belt type direct current motors for industrial machinery. These bulletins are illustrated and include diagrams and tables. Full information is given on these motors.

RAILWAY STRUCTURES.

Ashtabula, Ohio.—The Lake Shore & Michigan Southern is building a machine shop 42 ft. x 102 ft. on dock No. 2. Bids for the machinery have been received.

Corning, N. Y.—The New York Public Service Commission, Second district, has directed the Elmira, Corning & Waverly, now under construction, to build an under crossing under the tracks of the Erie Railroad in Corning. The cost of the work will be about $65,000.

Geddes, N. Y.—The New York Public Service Commission, Second district, has decided that Bridge street, in the town of Geddes, Onondaga county, should be carried over the tracks of the New York Central & Hudson River and the West Shore on a steel structure.

Harrisburg, Pa.—A contract has been given by the Pennsylvania Railroad to J. N. Bastress & Co., Harrisburg, Pa., for putting up a large freight transfer station in Harrisburg. The walls for the foundations are to be of concrete and the building of frame construction, covered with corrugated iron. The cost of the improvements will be about $150,000.

Hanford, Cal.—Plans are being made by the Southern Pacific, it is said, for putting up new stations at Hanford, Lemoore and Willow.

Hartford City, Ind.—The Pennsylvania Lines West, it is understood, will build a brick freight house, one and one-half stories high, 30 ft. x 100 ft., at an estimated cost of $30,000.

Lincoln, Ill.—The Chicago and Alton will build a brick passenger station, one and one-half stories high. The estimated cost is $20,000.

Little Rock, Ark.—The Chicago Rock Island & Pacific will ask for bids for a brick and steel freight house, one and two stories high, 46 ft. x 800 ft., equipped with steam heat.

Lemoore, Cal.—See Hanford, Cal.

Montreal, Que.—The Montreal Central Terminal Company, which holds a Dominion charter for the construction of subways within the city limits of Montreal, it is understood will start construction work soon on a central railway station in Montreal. (January 6, p. 64.)

Portland, Ore.—Work on the new Southern Pacific roundhouse mentioned in the *Railway Age Gazette* of December 16, 1910, is progressing rapidly, and it is expected that the structure will be completed early in the summer. The building will have 12 stalls and will be of brick and steel construction.

Quebec, Que.—According to press reports, the Grand Trunk Pacific will ask for bids during May for putting up a new station in Quebec. The company is also planning to put up shops near Quebec, for which bids may be asked for in the near future.

Sangerfield, N. Y.—The New York Public Service Commission, Second district, has ordered the elimination of the grade crossing of the Delaware, Lackawanna & Western at the North Brookfield-Waterville county highway, about one-quarter mile north of Sangerfield, in Oneida county. An under crossing is to be constructed in accordance with plans approved by the commission.

Seattle, Wash.—Work is nearing completion on the Northern Pacific's new bascule drawbridge over the Duwamish river at Seattle, and it is expected the structure will be opened for traffic early next month. The cost of the improvement is about $140,000.

Springfield, Mass.—An officer of the Boston & Albany writes that contracts have been given to the New England Structural Company, for putting up 11 steel bridges along the line between Springfield, Mass., and Worcester, also for a new bridge over the Charles river at Cottage Farm. The latter improvement is being carried out in connection with the double-tracking of the Grand Junction Railroad, from Cottage Farm to the Boston & Albany terminals at East Boston. The bridges all along the line will be heavy and modern, capable of carrying heavy rolling stock.

Toppenish, Wash.—The Northern Pacific has given a contract, it is said, to the Rounds-Hurson Co., Seattle, Wash., for building a station in Toppenish to cost $30,000. (April 7, p. 881).

Westerly, R. I.—An officer of the New York, New Haven & Hartford writes that $300,425 has been appropriated for improvements at Westerly, to include a new station to cost $20,000.

Willow, Cal.—See Hanford, Cal.

FOREIGN RAILWAY NOTES.

The Antung-Mukden Railway, Manchuria, has made progress some 20 per cent. in excess of what was estimated as feasible in the past year, so that it is expected to be running through by the end of this year, about six months before the completion originally contemplated. More than two-thirds of the great tunnelling work through the Fuchinlin range has already been completed, a total of 1,600 yds., leaving another 600 yds. to finish the tunnel, which the Japanese have been drilling at the rate of four yards a day. Another tunnel, exceeding 1,000 yds. in length has progressed with equal rapidity and only a few hundred yards remains to complete it.

A proposition for the construction of a one-meter gage railway from Viacha, Bolivia, to La Paz, without a state guaranty of any kind, has been made by the Antofagasta Railway Company to the government and accepted by the federal congress and approved by the president of the republic. The term of the concession is 99 years, after which period the railway, together with its appurtenances, will become the property of the state. The government will enjoy a reduction of 50 per cent. on the freight, pasenger and telegraph rates of the railway company. The company, on the other hand, may import free of duty, for a period of 30 years, the material and equipment necessary for the construction, maintenance and development of the railway, and is likewise exempt during this period from federal, state and municipal taxes. The company is also granted the right to run its freight and passenger cars over the line of the Viacha to La Paz Railway, now in operation, and at present owned by the Bolivia Railway Company.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Grand Trunk is in the market for 136 locomotives.

The Canadian Northern is said to be making inquiries for 9 locomotives. This item is not confirmed.

The Island Creek has ordered 1 eight-wheel switching locomotive from the American Locomotive Company. The dimensions of the cylinders will be 21 in. x 28 in., the diameter of the driving wheels will be 51 in., and the total weight in working order will be 173,000 lbs.

The St. Louis National Stock Yards have ordered 1 six-wheel switching locomotive from the American Locomotive Company. The dimensions of the cylinders will be 19 in. x 24 in., the diameter of the driving wheels will be 51 in., and the total weight in working order will be 121,000 lbs.

The Canada Iron Corporation, Montreal, Que., has ordered 2 six-wheel switching locomotives from the Montreal Locomotive Works. The dimensions of the cylinders will be 19 in. x 26 in., the diameter of the driving wheels will be 50 in., and the total weight in working order will be 124,000 lbs.

The Atlantic Coast Line has ordered 20 mikado locomotives and 15 Pacific type locomotives from the Baldwin Locomotive Works. The dimensions of these locomotives will be as follows:

	Mikado	Pacific
Type		
Gage	4 ft. 8½ in.	4 ft. 8½ in.
Cylinders	22 in. x 30 in.	22 in. x 28 in.
Valves	Balanced slide	Balanced slide
Boiler, type	Straight	Wagon top
Boiler, diameter	74 in.	66 in.
Boiler, working pressure	185 lbs.	185 lbs.
Boiler, fuel	Soft coal	Soft coal
Boiler, staying	Radial	Radial
Firebox, length	108⅛ in.	108⅛ in.
Firebox, width	72¼ in.	72¼ in.
Tubes, number	328	309
Tubes, diameter	2 in.	2 in.
Tubes, length	20 ft. 6 in.	20 ft. 6 in.
Heating surface, firebox	190 sq. ft.	190 sq. ft.
Heating surface, tubes	3,420 sq. ft.	3,303 sq. ft.
Heating surface, total	3,610 sq. ft.	3,493 sq. ft.
Grate area	54.2 sq. ft.	54.2 sq. ft.
Driving wheels, diameter	56½ in.	72 in.
Weight estimated, on driving wheels	175,000 lbs.	138,000 lbs.
Weight estimated, on truck, front	20,000 lbs.	42,000 lbs.
Weight estimated, on truck, back	28,000 lbs.	44,000 lbs.
Weight estimated, total engine	223,000 lbs.	224,000 lbs.
Tank capacity	8,000 gals.	8,000 gals.
Fuel capacity	12 tons	12 tons

CAR BUILDING.

The Grand Trunk is making inquiries for 1,000 box cars.

The Cambria & Indiana, Land Title building, Philadelphia, Pa., is making inquiries for 200 all-steel hopper cars.

The Pennsylvania is making inquiries for 41 coaches and 20 baggage cars.

The Seattle Car Manufacturing Company is making inquiries for 50 hopper cars.

The Lehigh Valley has ordered 3 postal cars from the Standard Steel Company.

The Bellingham Bay & British Columbia is making inquiries for from 25 to 50 hopper cars.

The Duluth, Rainy Lake & Winnipeg is making inquiries for 250 box cars and 100 flat cars.

The Barber Asphalt Paving Company, New York, is making inquiries for from 10 to 20 tank cars.

The Chicago, Burlington & Quincy has ordered 500 refrigerator cars from the American Car & Foundry Company.

The Canadian Pacific is making inquiries for from 1,000 to 2,000 box cars, and also for from 300 to 500 gondola cars.

The General Chemical Company, New York, has ordered 20 refrigerator cars from the German-American Car Company.

The Union Tank Line Company, New York, is said to be building 300 tank cars at its shops at Buffalo, N. Y. This item is not confirmed.

The Georgia & Florida has ordered 4 coaches, 1 combination mail and express car and 2 sleeping cars from the Central Car and Locomotive Works.

The Merchants Despatch Transportation, New York, will build 100 refrigerator cars at the company's shop. This company is also taking prices on 1,000 additional refrigerator cars.

The Dominion Iron & Steel Co., Sydney, Cape Breton, Canada, has ordered 25 flat cars, 25 gondola cars and 50 steel lined wooden ore cars from the Canadian Car & Foundry Company.

IRON AND STEEL.

The Atlantic Coast Line is said to be in the market for 5,000 tons of rails.

The Lehigh Valley has ordered 1,500 tons of rails from the Cornegie Steel Company.

The Guatemala Central is said to have ordered 3,500 tons of rails from the Steel Corporation.

The Oregon-Washington Railroad & Navigation Company is in the market for 14,000 tons of 90-lb. rails.

The Louisville & Nashville is said to be making inquiries for 100,000 tons of rails. This item is not confirmed.

The Nashville, Chattanooga & St. Louis has ordered 1,000 tons of rails from the Tennessee Coal, Iron & Railroad Company.

The Pennsylvania Lines West have ordered 500 tons of ferrotitanium open hearth rails from the Carnegie Steel Company.

The Baltimore & Ohio has ordered 1,600 tons of bridge material from the American Bridge Company for its bridge at Wheeling, W. Va.

The National Railways of Mexico have ordered several thousand tons of rails and structural steel from the Monterey Iron & Steel Company.

The Chicago, Milwaukee & St. Paul has divided an order for 40,000 tons of rails between the Steel Corporation and the Lackawanna Steel Company.

The Chicago, Rock Island & Pacific has ordered 8,000 tons of rails from the Illinois Steel Company and 8,000 tons of rails from the Steel Corporation.

The Siamese Government is prepared to receive tenders for a supply of fish plates, bolts, nuts, spring washers, spikes and bearing plates. The specifications and form of tender may be obtained from the Siamese Legation, Washington, D. C., on payment of $1.75, which will not be returned. All tenders must be addressed to H. Gittins, Controlling Engineer, Southern Line Department, Royal State Railways, Bangkok, Siam. Bids will be opened June 17.

General Conditions in Steel. The steel industry has not changed for two weeks. The steadiness of the present flow of business seems to indicate that the readjustment is over and that the next change should be for the better. Prices will not be cut for it has generally been decided that a reduction would not stimulate buying. The railways are expected to place large orders toward the end of June. The Steel Corporation is now operating at about 63 per cent. of its capacity.

SIGNALING.

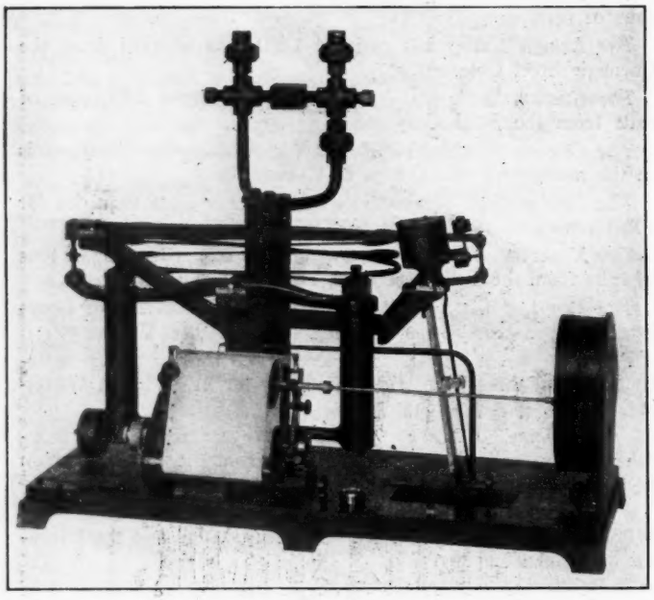
The Chicago, Indianapolis & Louisville will soon submit to the Railroad Commission of Indiana plans for the installation of automatic block signals between Indianapolis and Chicago and for manual block signals between New Albany and Michigan City.

Recording and Indicating Flow Meters.

Several types of flow meters have recently been developed by the General Electric Company, Schenectady, N. Y., to meet the growing demand of improved devices for measuring steam, gas, water and other fluids. Both the recording and indicating types have been made, the former making a continuous graphic record of the rate of flow and the latter giving readings of instantaneous values. The unit of measurement varies with the commodity measured, being pounds per hour for steam, cubic feet per minute for air and gas, and gallons per minute for water.

The recording water flow meter is shown in the accompanying illustration with its nozzle plug which screws in the pipe at the point where the flow is to be measured, thus being exposed to the pressure of the water. This plug has two sets of orifices;

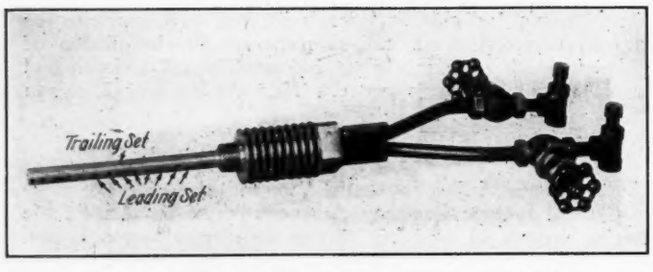
the leading set, located parallel to its axis, extending across the main and facing the direction of flow, and the trailing set, consisting of three holes located on the opposite side of the plug near the middle and at right angles to its axis. The two sets of orifices open into separate longitudinal chambers leading to the outer end of the plug. The plug is suitably arranged for use on either vertical or horizontal mains, and its introduction causes no appreciable drop in static pressure even at very high rates of flow. When the plug is inserted in the main,



Recording Water Flow Meter.

the water impinging against the orifices of the leading set develops therein, a pressure equal to the static pressure plus a pressure due to the velocity head; while the pressure set up in those of the trailing set is equal to the static pressure minus the pressure due to the velocity head, thus causing different pressures in the longitudinal chambers leading to the outer end of the plug. These different pressures are communicated to the meter through suitable pipes attached to the outer end of the plug and connected to flexible steel tubing placed within the meter case.

The meter element consists of two vertical cups or hollow cylinders connected together at the bottom by a tube. The U thus formed is filled with mercury to about half the height of the vertical cups and the whole arrangement is supported on a set of knife edges and is free to move like an accurately constructed balance. The different pressures in the two sets of orifices in the nozzle plug causes the mercury to rise in the left hand cup and to fall a corresponding amount in the right hand



Nozzle Plug and Piping for Water Flow Meter.

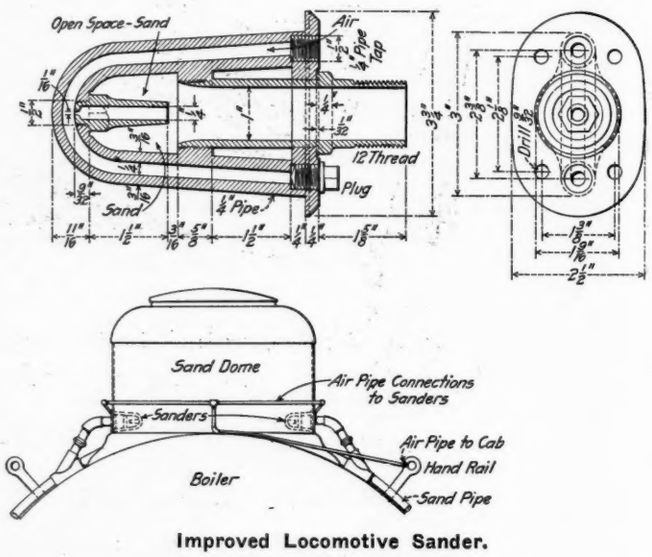
cup until the unbalanced mercurial column balances the difference in pressure. This action causes the beam, carrying the cups, to descend on the left hand side of the knife edges until the moment of the weights on the right hand side balances the moment caused by the displacement of the mercury into the left hand cup. The motion of the beam is multiplied by means of levers and actuates the recording pen, the movement of the latter being proportional to the amount of mercury displaced.

The drum carrying the recording paper is driven by an eight day clock and the paper is calibrated to record the flow in gallons per minute, thus the rate of flow may be read at any instant, or the average rate calculated for any given length of time. Although the meter is calibrated to record the rate of flow in gallons per minute at 89.1 deg., suitable means are provided for readily setting it for different temperatures, pipe diameters and rates of flow. In order to measure the flow under normal conditions in any number of different pipes, it is only necessary to use nozzle plugs of sufficient length to extend across the pipes, and record paper of suitable calibration range. This meter is useful for ascertaining the output of pumping plants; the input to water turbines and their loss of efficiency; the amount of feed water delivered to boilers; the amount of cooling water used in condensers; the slippage in pumps due to leaky plunger packing or worn out valves, and for discovering losses due to leaks in water mains, etc.

The recording air flow meter, suitable also for measuring steam and gas, operates on the same principle as the recording water flow meter, and is similar in all details of construction. The indicating steam flow meter is designed for testing work and other purposes, such as locating trouble due to leaks, determining efficiency of boilers, etc., where accurate, instantaneous readings of the rate of flow are desirable. This type of meter operates on the same principle and employs the same type of nozzle plug as the recording meter, but differs considerably in details of construction. It may be readily adjusted for various rates of flow and indicates the instantaneous rate of flow in pounds per square inch of pipe cross sectional area for steam, or in cubic feet of free air at 70 deg. F., for air.

Locomotive Sander.

The simple locomotive sanding device shown in the accompanying illustration, and patented by Charles Kabisins, an employee of the Denver & Rio Grande, is sold by Norman B. Livermore & Co., Salt Lake City, Utah. It is given the name Never Clog on account of its construction, which is the reverse



Improved Locomotive Sander.

of that ordinarily used; also it is less liable to clog. The air enters the ¼-in. curved pipe at the top and passes out through a 1/16-in. hole in the nipple at the center of the curved pipe. It expands into the opening in the nipple and passes directly into the 1-in. pipe, drawing the sand, which completely surrounds the U-shaped pipe and nipple with it. The lower half of the curved air passage acts as a trap to catch the scale or rust that collects in the piping. This trap is easily blown out and cleaned by removing the small plug on the outside of the sand dome. The force of this jet was tested by coupling one of the sanders to a 1-in. pipe 20 ft. long, fixed in a vertical position. The sander was placed in a pail of sand and when the air was turned on the sand flowed from the top of the pipe in a jet 4 ft. beyond the end.